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THE AUTOMOBILE

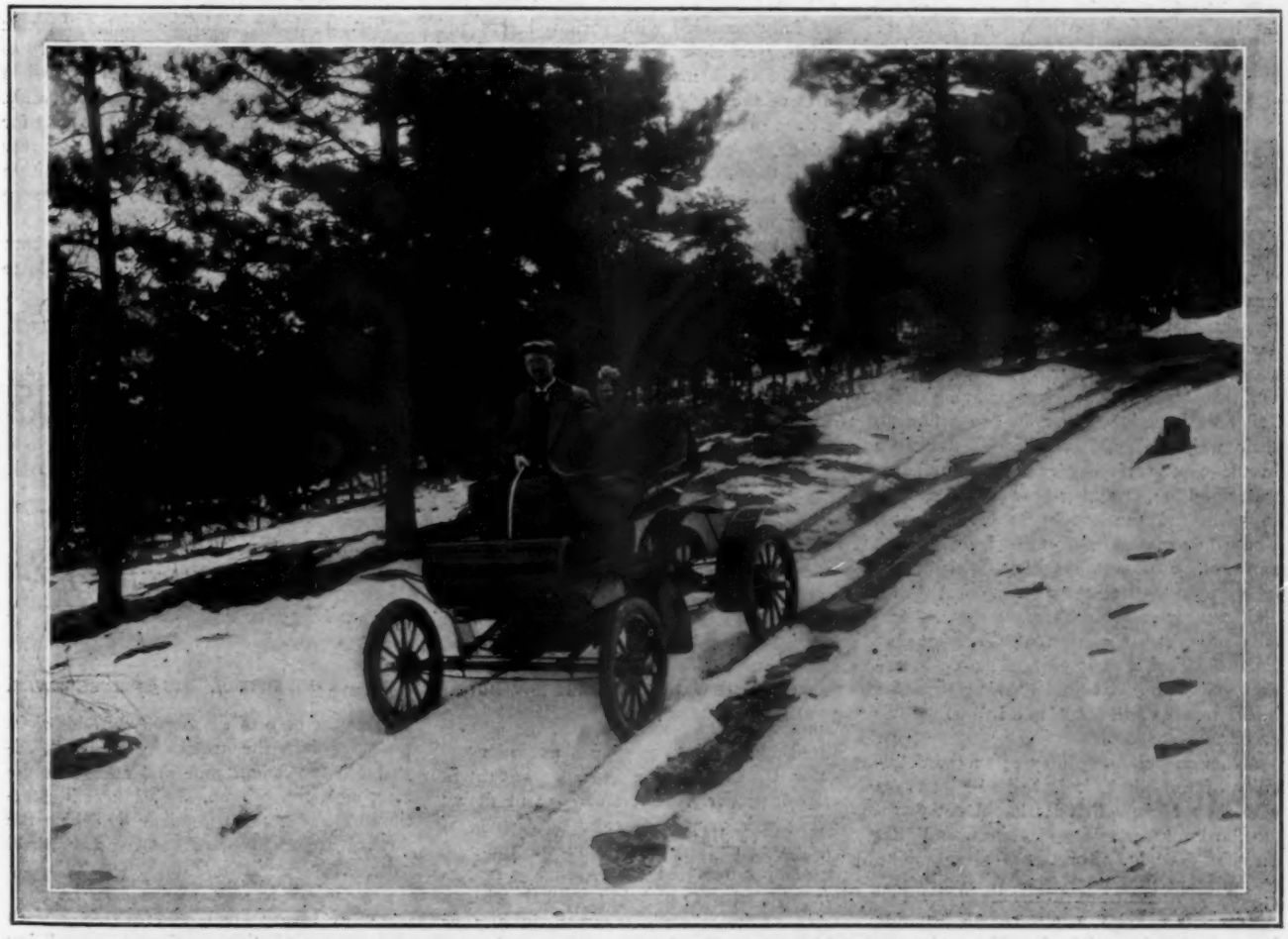
VOL. XII. NEW YORK—SATURDAY, APRIL 29, 1905—CHICAGO NO. 17

MOUNTAIN CLIMB UP PIKE'S PEAK.

Special Corresepondence.

DENVER, April 22.—The Western counterpart of the Mount Washington Climb to the Clouds in the East is the ascent of Pike's Peak, to be held in the last week in September of this year. This is to be the most spectacular feature of a three-day tournament which includes also a road race from Denver to Colorado Springs (seventy-five miles) and a race meet and outdoor automobile exhibition at Overland Park race track in Denver.

The ascent of Pike's Peak will provide a contest surpassing any heretofore organized to test the capabilities of a car and the dexterity and expertness of its driver. The length of the climb is to be seventeen miles—more than twice as long as the Mount Washington Climb to the Clouds—and an elevation of 7,000 feet is to be attained in that distance, the rise averaging more than 400 feet to the mile. The road is narrow



H. WEBER, OF COLORADO SPRINGS, DESCENDING PIKE'S PEAK, WHERE CLIMBING CONTEST WILL BE HELD IN SEPTEMBER.

and tortuous, and as it nears the summit is very rocky. Since the cog railroad up the Peak was completed the wagon road has fallen into disuse, and is now not in good repair, but it is the intention to have the bad places fixed before the contest, so that there will be no real dangers to be encountered by the expert driver.

Only one automobile has ever reached the top of the Peak so far as known. W. B. Felker, a dealer of this city, drove a Locomobile steam car to the very top in 1901, accompanied by C. A. Yont. The year before that John Brisben Walker reached the Halfway House in a Mobile steamer. No gasoline car has yet got to the top. H. Weber, of Colorado Springs, accompanied by W. G. Merrick, are believed to have reached the highest point this spring ever attained by a gasoline car—eight miles below the top, beyond which they were unable to go on account of the snow. The accompanying photograph, which is the first picture taken of the road up Pike's Peak since the announcement of the forthcoming contest, shows Mr. Weber making the return trip in his Oldsmobile.

The start of the ascent will be made at Cascade, a summer resort in Ute Pass situated six miles north of Manitou, which city is six miles west of Colorado Springs. The Springs is nearly 6,000 feet above sea level, Cascade is 1,500 feet higher, and the top of the mountain is 14,107 feet above the sea. At the top the barometer stands at less than eighteen inches, from which it can be seen that as it nears the top a gasoline car will lose half its compression, and that the water in the radiator will boil furiously. On this account steam cars having large boiler and engine power in proportion to their weight should stand a good chance in the contest if they can carry sufficient water and have running gear strong enough to withstand the roughness of the road. The grade of the road varies from 5 to 15 per cent. Although much work will have to be done in the way of removing stones and building culverts where there are washouts now, the Chamber of Commerce of Colorado Springs has pledged its co-operation and will do all in its power to assist in the repair of the road and in making the event a success.

FIG. 7.—SPIRAL SPRING STEEL WASHER.

Although opinions differ as to the feasibility of the climb, it is believed by those who should know that it should not prove too hard for first-class machines, and that the chief difficulty will be in adjusting engine and mixture to the variation in elevation.

You can't keep a water-cooled motor from overheating with air. If you let the water evaporate or leak out, expect trouble.

Small Inventors' Show at Paris.

From Our Own Correspondent.

PARIS, April 15.—The exhibition promoted in Paris under the name of the "Small Inventors' Show," intended to give poor inventors an opportunity to bring their devices to the notice of the public, contained a number of exhibits inspired by the automobile. Many of these, though as a rule far from perfect in their practical application, contained the germs from which important improvements may develop in the future. One inventor, struck with the idea that the chauffeur's hands and feet are fully occupied with various levers and pedals, set about relieving the work of some of these members by making use of parts of the body usually idle. The knees at once presented themselves to M. Renau, and he proceeded to make every possible use of them.

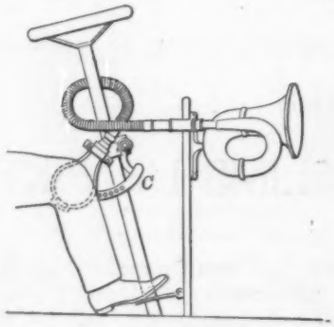


FIG. 1.—KNEE OPERATED HORN.

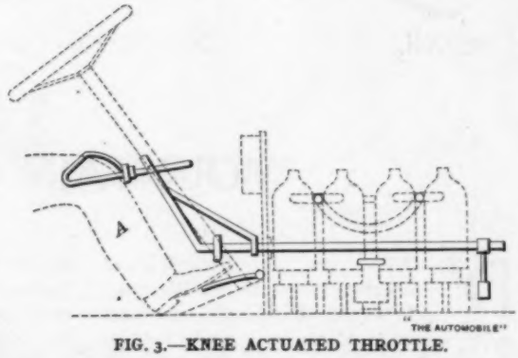


FIG. 3.—KNEE ACTUATED THROTTLE.

Fig. 1 shows a device which enables the driver to blow the horn by the pressure of his knee, thus avoiding the necessity of letting go of something to give a signal, perhaps at a critical moment. The bulb is mounted on a plate, which may be adjusted by moving it over the perforated sector *C*, so that the driver's knee will strike it properly. The arrangement shown in Fig. 2 is very similar, but is capable of a much wider range of adjustment, the bulb plate being mounted on a vertically swinging arm, the arm being drilled with a series of holes close together, in any of which the bulb plate screws may be secured. The arm is free to swing up and down, but when in use the bulb is held in position by the hook, *G*, which rests on the driver's knee. When the hook is released the bulb drops down out of the way.

A knee-operated controlling device, which may be used for any desired function, is shown in Fig. 3, a side movement of the knee causing the horizontal shaft to move through part of a revolution. In the model shown, however, the knee-loop shown at *A* was replaced by a built-up wire cap fitting closely over the knee.

Fig. 4 shows a knee-actuated ignition current cut-out for temporarily interrupting the operation of the motor, as when turning corners or slowing down in traffic. The device shown in Fig. 5 may be used for any desired control; in this instance the knee-lever is returned to its normal position by the helical spring *S* when the pressure of the knee is removed.

Fig. 6 is a combination by which both knees are employed. The driver's left knee presses the bulb of the horn, while his right knee fits into the crotch *K*, which is adjustable for height and distance from the steering wheel column. In all these illustrations *B* represents the collar by which the devices are attached to the steering wheel column.

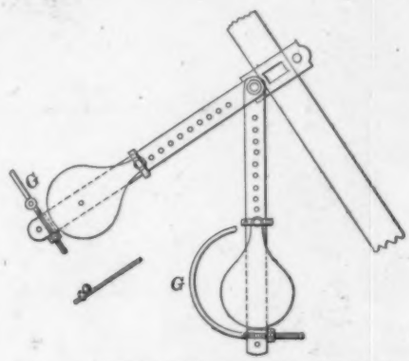


FIG. 2.—ADJUSTABLE BRACKET FOR BULB.

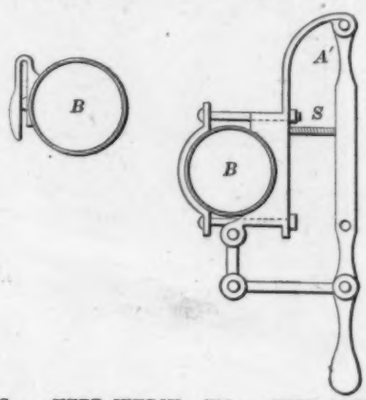


FIG. 4.—KNEE SWITCH. FIG 5.—KNEE LEVER.

The spiral washer shown in Fig. 7 is made of spring steel, and of many sizes and degrees of stiffness, the strongest being capable of supporting with very little de-

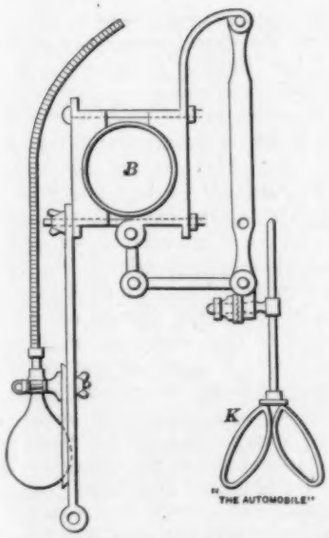


FIG. 6.—COMBINATION KNEE CONTROL.

flection a weight of sixty-five pounds, while the lightest will hardly carry an ounce. The application of this spring washer to an operating rod joint is shown in Fig. 8. The principle is obvious. The eye and pin are fitted together on a taper, and the joint is kept always free from lost motion by the spring washer, which causes the eye to ride up on the tapered pin as fast as wear takes place. No nut is necessary, the spring washer being held in place by a plain split-pin or cotter. By rounding the bearing in the eye as in Fig. 9, instead of tapering it to correspond with the taper of the pin, the properties of a ball joint are obtained with-

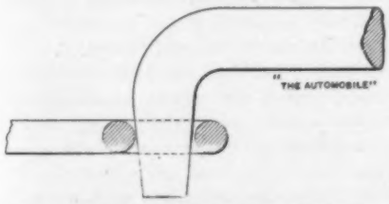


FIG. 9.—SELF-ADJUSTING TAPER JOINT.

in a limited range, together with the self-adjustment for wear, and the cost of such a joint is very slight indeed. Among the samples shown was a remarkable joint of this kind, in which the eye was made of a loop of stout wire; these joints seem, notwithstanding their cheapness, to be quite good enough for the most expensive automobile.

Fig. 10 shows an operating lever intended to be a less expensive and at the same time a superior substitute for the standard ratchet arrangement. Each of the flat springs *S S* is made integral with one of the inside-toothed washers *V V;* the outer toothed washers are fast on the arms of the fork from which the operating handle springs. The teeth of the inside washers are held in engagement with those of the outside washers by the outward pressure of the springs; but when a rotative motion is

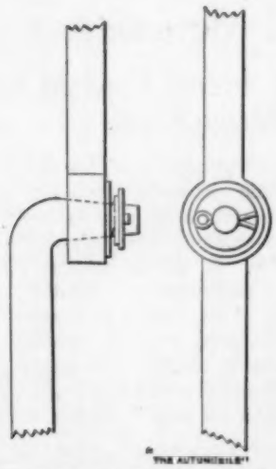


FIG. 8.—SPRING WASHER ON TAPER JOINT.

given the outer washers by moving the operating handle, the teeth are forced apart and ride past each other, coming together instantly when the handle is released and holding it firmly in position. There can be no looseness on account of the springs, and what slight wear occurs is distributed evenly over a great area and cannot affect the working of the device.

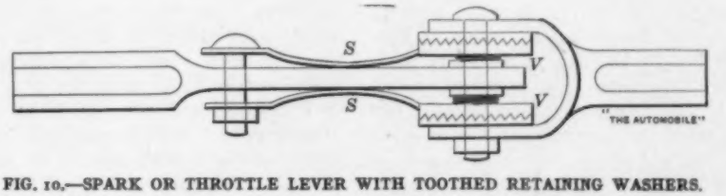


FIG. 10.—SPARK OR THROTTLE LEVER WITH TOOTHED RETAINING WASHERS.

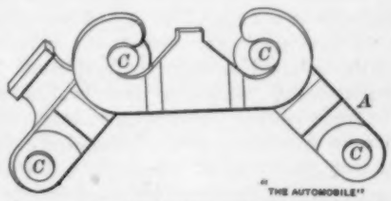


FIG. 11.—CHAIN WITH ONE-PIECE LINKS.

It will be noted that in all the devices mentioned so far spring elements, judiciously used, play in important part, eliminating troubles due to wear and vibration; all these inventions have been patented.

A most ingenious form of power transmission chain was shown, and is illustrated in Fig. 11. The salient feature of this chain is its absence of loose or built-up parts, each block being one single forging or casting, as the case may be, with no rivets, bolts, plates or flanges. Though very easily taken apart, it cannot come apart when in use, no matter how slack it may be, as the projection formed at *A* makes it necessary to bring the two elements at right angles with each other, in a direction opposite to their position on the sprockets, in order to separate them; this position is an absolute impossibility under any conditions of use. Special sprockets must be used, and these consist of flanges set far enough apart for the chain to pass between them, and provided with notches which take the pins *C C C C*, the latter being formed integral with the blocks. Considerable experimenting has been done with these chains at the Central Berlin Laboratory. Rough, unmachined cast steel blocks weighing a little more than ten ounces each were tested to a breaking load of two tons for the complete chain. One meter of such chain, weighing roughly eleven pounds, costs 83 cents. Finished chains have been run at speeds up to 100 feet per second with entire success, and their operation was in no way affected by sudden jerks or variations of load.

The feature of the puncture-preventing device illustrated in Fig. 12, is that it will work well even if the tire to which it is applied is very much out of true. The ball-bearing flanged roller *R* is kept lightly pressed against the tire by a spring *S* and the anti-puncture plate *T* is attached to the roller axle at one end and to a bracket bar, on which it is freer to move laterally, at the other. Thus the plate is kept always at about the same distance from the periphery of the tire, following its contour faithfully. By turning the whole device on the bracket bar, so that the roller runs before the plate instead of after it, the apparatus may be used on tires to which *manchons*, sleeves, tape wrappings or other emergency protectors have been applied.

The Viavant air-cooling system for gasoline motor cylinders is another innovation. This system, shown diagramatically in Fig.

(*Continued on page 543.*)

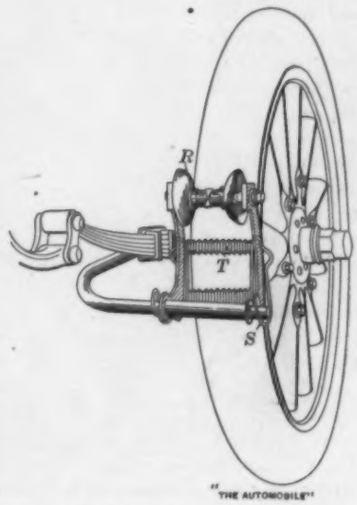


FIG. 12.—ANTI-PUNCTURE PLATE GUIDE.

Progress of State Aid Movement.

Work of the Legislators That Will Hurry Forward the Improvement of Roads in Many States.

SLOWLY but with perseverance the advocates of highway improvement are attaining their ends, and there is much in the present situation to encourage continued activity in this direction. Three of the most important Middle Atlantic states have enacted important good roads laws during the legislative sessions just closed, the project of the New York and Chicago Road Association is being well supported and aided by the representative commercial and trade organizations in the cities along the proposed route of the interstate highway for the realization of which the Association is working, and plans are well advanced for a number of big good roads conventions during the coming summer.

New York Bonding Scheme.

A departure that seems likely to result soonest in the construction of the greatest mileage of first-class roads is the proposition to issue bonds to the amount of $50,000,000 for the building of macadam roads in New York state. The proposed amendment to the state constitution to make this legal passed the assembly at Albany week before last and will be submitted to popular vote at the state election next November. If it is carried by a majority vote, it will enable the state to provide funds to meet promptly the expense of constructing macadam roads as fast as the various counties petition for the improvements.

Although the state aid law has been in effect in New York for seven years, only 700 miles of road had been constructed or were under contract at the end of last year, whereas the counties had petitioned for the improvement of 4,500 miles. The state appropriations to meet its share of 50 per cent. of the cost have been increased each year, until last year the amount was $1,500,000, but the appropriations were utterly inadequate to meet the demands of the counties and the appropriations made by them for their share of 35 per cent. There are more than 74,000 miles of public roads in the state, and it is estimated that from 8,000 to 10,000 miles will be improved ultimately under the state aid law. At the rate of construction that has prevailed up to the present time, it would require nearly 100 years to do the work—and most of us Americans, especially the automobile fraternity, which likes to accomplish things in a hurry, are not disposed to wait so long. The purpose of the constitutional amendment is to furnish the means to get the work done as rapidly as possible and to enable the state to keep pace, at least, with the counties and towns as they make their petitions.

The average cost per mile of construction of first-class roads is estimated at $7,000, so that the total cost of improving 7,400 miles of main highways would be approximately $50,000,000. Expended at the rate of $5,000,000 a year, the funds raised under the bonding plan would in ten years provide for all the work. If the amendment passes, the counties and towns will pay the same proportions of the cost as at present, but will have fifty years in which to make the payments, being charged each year 2 per cent. of the principal on the bonds and 3 per cent. interest on the unpaid amount.

Pennsylvania's New Law.

Just before adjourning this spring, the legislature of Pennsylvania passed an act providing for the establishment of a state highway department and for state aid in road building. At last advices this only awaited signature by Governor Pennypacker to become effective at once. It provides that immediately upon approval of the act a State Highway Department shall be established by the appointment by the governor, for a term of four years, of a state highway commissioner, who shall be a competent civil engineer and experienced in the construction and maintenance of improved roads, and who shall appoint the necessary assistants for the conduct of the department. Authority is given to the supervisors or commissioners of any township to petition the commissioners of their county to make application to the State Highway Department for state aid in the reconstruction or permanent improvement of any principal highway in the township. Upon receipt of a petition signed by the owners of a majority of the assessed valuation of real estate in any township requesting such application, the supervisors or commissioners must petition the county commissioners, and in event of their failure to act, the property owners may apply to the court for an order upon them to do so. Upon receipt of such petition from the commissioners of the township, the county commissioners must pass a resolution petitioning the State Highway Department to undertake the work and authorizing the county to assume its share of the expense, as provided in the act.

To prevent the obstruction tactics of the county commissioners under the former law, the township supervisors may apply to court for the appointment of a "jury of view" to examine into the need of such improvement and report upon it. If the report is favorable, the court may order the county commissioners to petition the highway department.

When the state highway commissioner receives a petition asking for the improvement of a road outside of the corporate limits of any city, he must examine the road, determine what changes should be made, where and how the improvement should be made, prepare surveys and estimates and report back to the county commissioners. Then the State Highway Department may contract with the county and township to make the improvement, the expense to be borne in the following proportions: 83 1-3 per cent. by the state, 8 1-3 per cent. by the county, and 8 1-3 per cent. by the township or townships in which the improved highway lies. The state aid is, however, to be apportioned among the several counties of the state according to the mileage of township or county roads in each. The counties are given an incentive to take advantage of the state's assistance by a provision that the money apportioned to any county may, if it is not applied for before May 1 of any year, be divided among other counties that have in that year filed applications requiring the expenditure of a sum larger than their apportionments.

All roads improved under the provisions of the act must conform to the standard of construction established by the State Highway Department. No section of road improved shall be less than half a mile in length, nor the improved surface less than twelve feet wide. Counties and the State Highway Department are given authority to enter into agreements with boroughs to bear a portion of the expense, not exceeding two-thirds, of improving sections of important main roads lying within the borough limits, provided an improved road has been constructed to the line of the borough in an adjoining township or borough. Any borough which is willing to pay one-sixth of the cost of improving a section of continuous main road may petition the department direct.

All highways constructed or improved under the act are to be known as state highways, and must be kept in a standard of condition prescribed by the State Highway Department at the expense of the township in which they are located, except that the state sets aside 10 per cent. of the amount available for highway purposes to be used for road maintenance, and each township's or county's apportionment of the money may be applied for by the commissioners on or before May 1 of each year. No street railway is to be built on any portion of a state highway except with the consent and under the conditions prescribed by the state highway commissioner.

The highway commissioner is required to have made a complete survey of all the roads in the state, and to compile statistics and collect information regarding mileage, character and condition of the highways.

The new act appropriates the sum of $6,356,232.47 to carry out the provisions of the act, of which amount $865,232.47 is made available in the fiscal year ending May 31, 1905, and $1,250,000 in each of the two years following, and $1,500,000 in each of the two years next succeeding.

New Jersey Law.

On April 3 of this year Governor Stokes signed a new law providing for the codifi-

cation of the road laws of the state of New Jersey and increasing the power of the state highway commissioner in the matter of the way in which roads are to be built. New Jersey was one of the first states to adopt the state aid system and has in the last ten years made herself famed for the superiority of her highways. The annual report of the late highway commissioner, Henry I. Budd, for the year 1904, was only recently issued. It shows that in the thirteen years since the state aid law was passed there have been constructed 1,043 1-2 miles of good road. At the end of 1904 petitions had been filed for the improvement of 425 1-2 miles more, at an estimated cost of $1,924,947. In the last year nearly 108 miles of highway were improved under state aid.

Missouri Now in Line.

Two laws were passed last month by the Missouri legislature that will help the good roads movement in a state that needs highway improvement more, perhaps, than any other state in the Union, for her roads are notoriously bad. One of the measures authorizes counties to employ funds raised under an indirect tax system in the building and grading of roads, and the other provides for submitting to the voters an amendment to the state constitution authorizing the levy and collection annually of a state tax of five cents on $100 of assessed valuation on all objects of taxation to raise a fund that shall be set apart and apportioned among the counties as a permanent fund for public roads.

Ohio Joined a Year Ago.

Ohio joined the list of state aid commonwealths a year ago, when the general assembly enacted two laws, one creating a State Highway Department and the other placing improved roads under its supervision. The new dapartment issued its first bulletin last month. It contains a reprint of the two laws, copies of the blank forms for petitions for the improvement of roads, and an explanation by State Highway Commissioner Sam Houston of the purposes of the laws.

Two conditions prevent the construction of any roads this year, however. A provision of one of the bills requires that county commissioners, in order to avail themselves of the one-quarter of the cost of improvement of a piece of road to be paid by the state, must file their applications before January 1 of each year. No appropriation for the organization and operation of the new department was available until February 15, 1905, so that no applications could be filed before January 1. The appropriation for 1905 was only $10,000, yet the law provides that the amount shall be divided equally among the counties and that no piece of road less than one mile in length shall be constructed under state aid. As an equal division of the $10,000 appropriation makes only $113.63 available in each county as the state's share, and the county's share amounts to only three times as much, there is a total of only $454.52 available in each county, which is only about a tenth of the amount necessary for the building of a mile of macadam road.

State Aid in New Hampshire, Too.

The latest state to adopt the now popular state aid system is New Hampshire, whose legislators no doubt realize the importance of good roads in attracting tourists as well as in enabling the farmers to get their products to market with the least loss of time and energy.

The new law places in the hands of the governor and council the control of the improvement of roads outside towns and cities, and appropriates the sum of $125,000 annually for six years from the funds of the state to be used as the state's proportion of the expense of road work both inside and outside of town limits. The proportions of state assistance are fixed on a sort of sliding scale according to the assessed valuation of the towns and places, amounting in the smallest places to $1.25 for every dollar appropriated locally and in the largest cities and towns to twenty cents for every dollar.

Prospects of Government Assistance.

Good roads advocates throughout the country have been very anxious to secure a national law that will further the movement in all the states. A bill providing for government aid on the lines of state aid was introduced in Congress by Representative Brownlow, and by persistent support got as far as a favorable report by the senate committee on agriculture a year ago last winter, but was pigeon-holed by another committee. Prospects of further favorable action on this bill are now not considered to be very bright, but it is likely that a new bill embodying the same ideas will be introduced in Congress next winter. A bureau has only recently been established in Washington by the National Association of Automobile Manufacturers and the Automobile Club of America jointly to keep up the agitation for a national appropriation to be apportioned among the states for the purpose of encouraging highway improvement.

A big international good roads convention is to be held this summer in Portland, Ore., during the Lewis and Clark Exposition, and another will be held in August at Lakewood, on Chautauqua Lake, to give additional impetus to the movement.

All of these things, and many others, indicate clearly that the country is more awake than ever before to the great need for better main thoroughfares between our large cities and towns.

PROTECTION WHEN TOURING.

The accompanying illustration shows an excellent form of the popular Cape cart top for automobiles—a means of protection which is at once light, easily carried, out of the way when not in use, and effective as a protection from bad weather when extended over the car. It is distinctly useful even when folded, as it acts as an efficient dust guard. When raised and with the side curtains buttoned in place, the occupants of the rear seat are fully sheltered, while a considerable measure of protection is afforded the chauffeur. Transparent windows in the sides and rear enable the passengers to look out. This type of covering goes a long way toward making the ordinary touring car an all-weather vehicle. While the illustration shows a top applied to a Napier car with rear-entrance body, special forms are made to suit the 1905 cars having side entrances.

Frank F. Peard, president of the Herald Publishing Company, of Baltimore, has joined the ranks of automobilists, having recently become a member of the A. C. of Maryland, and purchased an Oldsmobile.

CAPE CART HOOD WITH SIDE CURTAINS IN PLACE FOR BAD WEATHER.

Details of Monaco Auto Boat Races.

From Our Own Correspondent.

MONACO, April 15.—Sunday morning, April 9, was fixed for the opening of the races following the exhibition of auto boats last week. The program included races for eight-meter boats over a 100-kilometer (62-mile) course, and for cruisers of six and a half meters (twenty feet) with cylinder capacity of not more than two and a half liters over a course from Monaco to Nice and back. For the racers the prizes were $1,100, $400, $200 and $100 respectively for first, second, third and fourth positions. The prizes for the cruisers were $800, $200, $140 and $60 for the respective winners.

The eight cruisers entered in the *small* class were started first, followed shortly by six eight-meter racers. No sooner had the small cruisers disappeared around the cape than the wind arose and stirred up a sea rather dangerous for such light boats. The *Gobron* had its bow broken by a collision soon after the start and returned to port. The Renault boat, *Billancourt,* had to put into port after a short run, owing to the heavy sea, and she was followed by *Palaisoto II.* and *Madrioto.* The racing committee then called off the day's races, and *Antoinette* and *La Rapière,* which had rounded the third buoy after a dangerous run, also returned. The cruisers were even less fortunate, for on the home run from Nice to Monaco the *Marguerite* was driven on the rocks and sunk, her crew being rescued by the customs officers, and *Chantier d'Antibes I.* was so badly tossed about by the seas that she had to be taken in tow by *Titan VI.* and *Avenir VII.,* all three boats taking shelter at Villefranche. Only two boats—*Joliette III.* and *Lanturlu*—finished the course, and of these the latter was disqualified for having failed to round a buoy when entering port late at night.

Monday morning the weather was no better and no races were held. But on the succeeding day the weather was fine. The program included a course of 100 kilometers for racers of twelve meters, and a run from Monaco to Nice and back, and from Monaco to Mentone and back, for cruisers measuring from six and a half to eight meters. In the afternoon the 100-kilometer race for eight-meter racing craft, postponed from Sunday, was run off.

Eight twelve-meter boats started: *Napier I.* (piloted by her new owner, Lord Howard de Walden), *Napier II.* (steered by Arthur Macdonald), *Mercedes, Palaisoto, Suzon Legru, Baby II., Turquoise* (piloted by Madame du Gast) and the *C. G. V.* The Mercedes went quickly into the lead at the start, and at the end of the first round was well ahead and continued to increase her lead to the end of the second leg. Then she suddenly stopped, a wave having washed into her long, open cockpit and put her magneto out of service. The English *Napier II.* then took the lead, followed closely by the 150-horsepower *Palaisoto* Panhard boat, with Madame du Gast's *Turquoise* third. Soon *Palaisoto* suffered the same fate as *Mercedes,* and *Napier I.* held second place. On the sixth leg of the eight legs of the course the *Turquoise* engines stopped. The race was finished as follows:

Order.	Boat.	Pilot.	Time.
1.	*Napier II.*	Macdonald	2hr. 25m. 54s.
2.	*Napier I.*	Lord de Walden	2hr. 46m. 18s.
3.	*C. G. V.*	Marquis de Jesse	3hr. 40m. 8s.
4.	*Suzon Legru.*	Le Blon	4hr. 22m. 21s.

Tuesday's race for cruisers of six and a half to eight meters was won by a Swiss boat, *Excelsior VII.* A heavy last year's boat, *Le Nogentais,* carrying a 24-horsepower Richard Brasier engine, finished second, and third and fourth places were won by *Bigort Delahaye* and *Titan III.,* each fitted with Delahaye engines.

The postponed race for eight-meter boats brought forth four competitors: *La Rapière,* built by Tellier, with 100-horsepower Panhard engine; *Billancourt,* built by Pitre, owned and engined by Renault brothers and named after the suburb of Paris in which their works are situated; *Antoinette,* built by Tellier and engined by Levavasseur; and *Palaisoto II.,* by the same builder and carrying an 80-horsepower Renault motor. The distance, 100 kilometers, was covered in the following times:

La Rapière, 2 hr. 26 m. 30 s.; *Billancourt,* 2 hr. 46 m. 20 s.; *Antoinette,* 2 hr. 47 m. 34 s.; *Palaisoto II.,* 2 hr. 53 m. 52 s.

Wednesday, April 12, was reserved for racers of from twelve to eighteen meters, over a 100-kilometer course, and for cruisers of eight to twelve meters over a 60-kilometer course. Only three boats were entered in the racing class: *Pi-Ouit IV.,* belonging to M. Damoy-Picon, and carrying a Turcat-Mery motor; *Dubonnet,* with a Delahaye motor, and *Panhard-Levassor,* with a Panhard motor. Just before the hour for starting the *Panhard-Levassor* was found to be in a sinking condition, the prong of an anchor having made a large hole in her hull. The race was really a walkover for *Pi-Ouit IV.,* which covered the distance in 3 hr. 10 m., and carried off the first prize of $1,200. The *Dubonnet* furnished some good speeds at intervals; but the engines were not in proper running order, and 3 hr. 48 m. 6 s. were occupied in covering the 62 miles, for which its owner took the second prize of $400.

The race for cruisers resulted in a victory for the well-known Italian firm, F. I. A. T., *Fiat X.* covering the 60 kilometers (37 miles) in 2 hr. 36 m. 33 s., thus winning first prize of $1,200. The *Tetu,* built by Tellier and fitted with a Delahaye motor, finished second in 2 hr. 40 m. 46 s., gaining $400. *Delahaye* came third in 2 hr. 50 m. 9 s., winning $200.

Thursday's events consisted of a 125-kilometer (78 miles) race for cruisers, the course being from Monaco to Nice, San Remo, and back to Nice and Monaco; a 74-kilometer race for fishing boats, and a competition for ships' boats. Three craft entered for the cruisers' race, the result being as follows:

1. *Dietrich II.,* belonging to M. Perignon, Dietrich motor; time, 4 hr. 41 m. 25 s.; average speed, 26 k. 700 m. an hour. First prize, $1,200.

2. *Mercedes C. P.,* 45-ft. cruiser, one Mercedes 90-horsepower engine; time, 5 hr. 21 m. 23 s.; average speed, 23 k. 365 m. Second prize, $400.

3. *Chantier d'Antibes;* time, 6 hr. 23 m. 45 s.

Owing, it is thought, to a short circuit, fire broke out on board the *Trèfle-à-Quàtre,* formerly owned by M. Richard Brasier, and now the property of M. Thubron. Efforts were made to get the burning craft away from the other boats, and one of the officials of the meeting went on board the burning craft and with a hammer knocked several holes in her hull, causing her to sink. The boat has been raised, and, although the engines are intact, the hull is so much damaged that *Trèfle-à-Quàtre* will never again be steered to victory.

Friday's events consisted of the championship of the sea, a 200-kilometer scratch race for all boats up to eighteen meters; and a race for yachts from eighteen to twenty-five meters, from Monaco to San Remo, Monaco, Antibes, Monaco. In the latter race there was only one starter, the automobile yacht *Mercedes-Mercedes,* built on the Seine by Pitre & Co., engined by the Mercedes firm, and owned by Herr Jellineck Mercedes. It covered the distance of about 62 miles in 6 hr. 25 m. 12 s.

The championship of the sea brought together twenty-one boats, the foreign competitors being the two Napier craft and the *Mercedes-Charley,* and proved to be the most interesting of all the races. The result, a complete victory for the French boats, has more than compensated, in the eyes of the French, for the defeats of the earlier part of the meeting. The result was:

1. *Panhard-Levassor,* 12 1-2 meters, 100-h.p. Panhard motor; piloted by Marquis de Vogué; time, 4 hr. 22 m. 54 s.; average speed, 28 1-5 miles an hour; first prize, $1,200.

2. *La Rapière,* 8 meters, 100-h.p. Panhard motor; time, 5 hr. 14 m. 8 s.; second prize, $500.

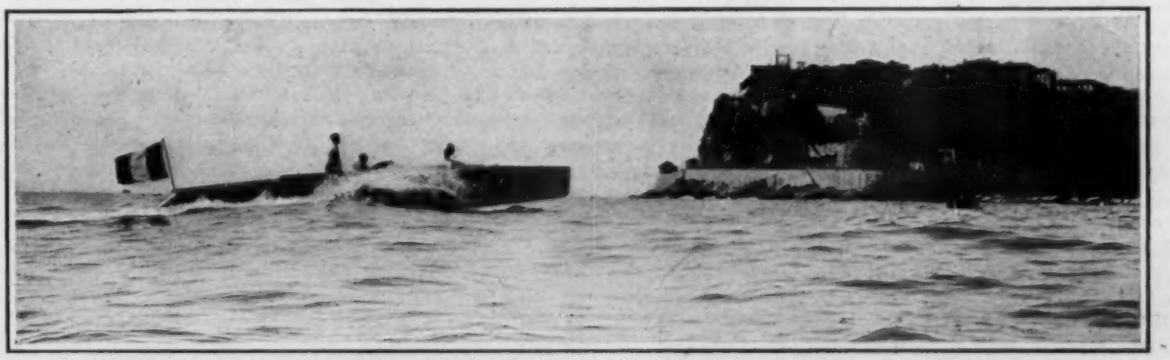
3. *Palaisoto II.,* 80-h.p. Renault motor; time, 5 hr. 32 m. 55 s.; third prize, $300.

4. *Madrioto,* 8 meters, 80-h.p. Renault motor; time, 5 hr. 40 m. 1 s.

Fifth position was taken by *Têtu,* with a Delahaye motor; sixth by *Pi-Ouit IV.* and seventh and eighth by the cruisers *Delahaye I.* and *Elise.*

The Franco-German boat, *Mercedes-Charley,* the hull of which was built in

France, the engines in Germany, and which was cleverly handled by Florio, got clear away from the fleet at the start, and at the second round had a lead of at least 100 meters on *Panhard-Levassor* and 500 on *Napier II.* Suddenly, however, she stopped and had to be towed back to port, owing, it is said, to defective lubrication having caused some of the bearings to seize. After none the worse for their immersion. As soon as the accident was announced to the committee they stopped the races. In the earlier part of the meet the *Panhard-Levassor* had its bow damaged, but the damage was made good by a metal sheath. One of the frames in the bow gave way and the fore part of the boat was stove in under the pressure of the sea. As she went down



FRENCH 100-H. P. "GOBRON," WHICH HAD ITS BOW BROKEN BY AN ANCHOR, ENTERING MONACO BAY AT SPEED.

this, victory lay between the French boat *Panhard-Levassor* and the English *Napier II.* On the eighth turn *Napier II.*, still running with great regularity, withdrew and entered port by its own power, followed shortly after by *Napier I.*, leaving eight boats to finish the race.

SINKING OF PANHARD-LEVASSOR.

MONACO, April 17.—Saturday's racing was devoted to handicaps for both racers and cruisers. The weather was fine and the sea calm when *Baby II, Pi-Ouit IV, Palaisoto II, Madrioto, Antoinette, Napier II, La Rapière* and *Panhard-Levassor* started in the first class. The *Panhard-Levassor* was scratch boat and gave 36 m. 30 s. to *Baby II.*

When *Panhard-Levassor* had reached the third buoy she was seen to disappear suddenly. Boats in the vicinity immediately went to the rescue and picked up the owner, Count de Voguè, and the two mechanics, in deep water there appears to be no possibility of ever refloating her.

Twenty-seven boats started in the cruiser handicap, *Fiat X* being scratch. Nearly all of the competitors arrived within a half hour interval. The course was from Monaco to Nice and back, a distance of 42 kilometers (26 miles), and was covered by *Dietrich II* in 1 hr. 24 m. 11 s. On the handicap, however, the first prize was won by *Le Nogentais.*

Sunday's program consisted of the nautical mile race and the kilometer flying start, the most interesting and important of all the races. Three preliminary series were run —the first won by *Rapière* from *Madrioto;* the second by *C. G. V.*, having as a rival the *Fiat X*, and the third by *Dubonnet*, which practically walked away from *Dietrich II.*

The final was run between *Dubonnet*, 49 feet, 300-horsepower Delahaye; *C. G. V.*, 39 feet, 120-horsepower, eight-cylinder C. G. V. engine; *La Rapière*, 26 feet, 100-horsepower Panhard motor.

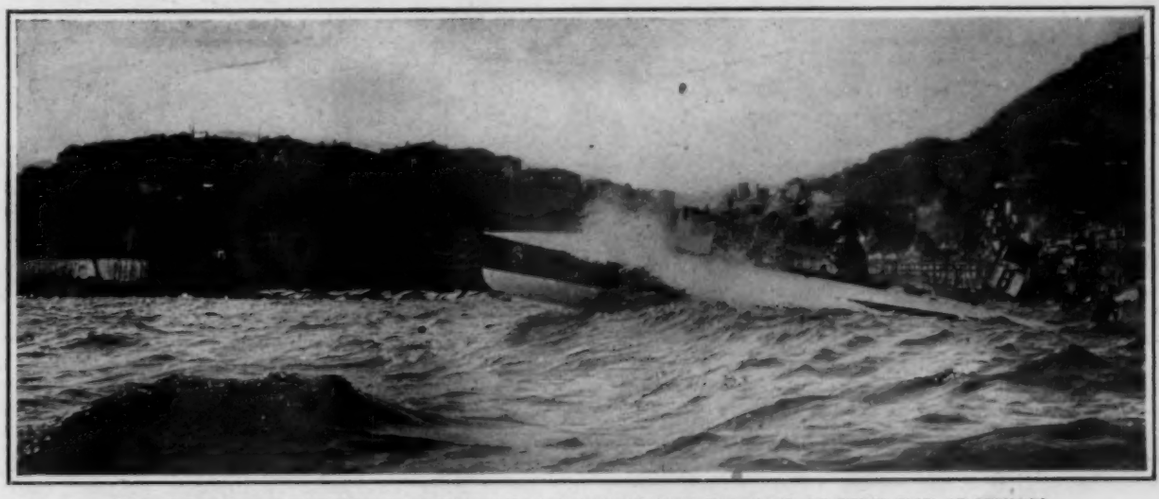
The *Rapière* had a good start and immediately passed first. The *Dubonnet* got up speed more slowly, but gradually crept up to its small rival, and at about the 1800th meter passed ahead and finished with a lead of several lengths covering the kilometer in 1 m. 8 4-5 s., giving an average of 52 kil. 320 m. (32 1-2 miles) an hour, the highest speed which has yet been attained by a power boat.

The times for the final are:

	Kil.	Mile.	Total.	Average.
Dubonnet....	1m. 9s.	2m. 30s.	3m. 39s.	46k. 910m.
La Rapière...	1m. 16s.	2m 29s.	3m. 45s.	45k. 630m.

Thus *Dubonnet* gains the Prince of Monaco $2,000 cup, and *La Rapière* carries off second prize of $300.

To-day (Monday), the closing day, was devoted to the fifty-kilometer handicap for racers, postponed owing to the accident to *Panhard-Levassor*, and to various consolation races for both cruisers and racers. The handicap resulted as follows:



RENAULT 80-H. P. "MADRIOTO," WHICH WON FIFTY-KILOMETER HANDICAP ON FINAL DAY AT MONACO.

Place.	Boat.	Engine.	Handicap time.
1.	*Madrioto*.....	Renault.....	1hr. 13m. 15s.
2.	*Pi-Ouit IV*.....	Turcat-Mery.	1hr. 14m. 28s.
3.	*Palaisoto II*.....	Renault.....	1hr. 14m. 36s.
4.	*C. G. V.*.....	C. G. V.....	1hr. 20m. 19s.
5.	*Baby II*.....	Brooke.....	1hr. 40m. 35s.

The Problem of Air Cooling.

By F. REAUGH.

THE air-cooling problem is an interesting one, and is also one of the most vital importance to the motor interests of to-day. That the cumbersome water-cooling system marks but a transition period, and is doomed to final elimination, is evidenced by the whole trend of recent improvement. The honeycomb cooler itself, reducing, as it does, the water from gallons to quarts, is a great step in that direction, while the numerous arrangements for forcing or directing the draft, together with copper fins and such refinements have made the small air-cooled motor of to-day an undoubted success. But, as yet air-cooling has its limitations.

It is the purpose of the writer in this paper to consider some of the difficulties in the way of air-cooling and some possible ways of surmounting them.

To begin with, it may be positively asserted that any cooling system, whether by air or water, depends for efficiency on its adaptation for convection. Radiation plays but a small part in any case; in the honeycomb cooler, for instance, none at all. Radiated heat, as is well known, passes out in a straight line, irrespective of the air and its currents, until it meets some absorbing or reflecting body, which in a radiator is usually another part of itself. Now, adaptation for convection consists in exposing the heated parts to the greatest possible quantity of the coolest available air. To do this it is not enough to have a great amount of radiation surface. Air is a poor heat conductor; it does not readily absorb heat from particle to particle, but each particle must come into actual contact with the heated surface and then make way for other particles to take its place; hence, the air must have motion, and the greater that motion the less the necessary extent of radiation surface, and *vice versa*. This is a vital point in air-cooling systems where the amount of heated surface is necessarily limited, and it seems to the writer that it is a point that has sometimes been lost sight of by builders of air-cooled motors.

Before going further with air-cooling, it may be well to consider briefly some of the leading features in water-cooling, which, after all, is only air-cooling second hand.

Since—to state it broadly—all cooling depends on the difference of temperature and the amount of contact between the air and the heated surface, it has become a recognized fact that the readiest way to obtain the requisite contact is to enlarge the heated surface. To do this water is used to conduct the heat from the cylinder to a series of flanged pipes or other forms of so-called radiator, which is placed where it will be exposed, more or less, to currents of passing air; the function of the water being merely that of a conveyance. This describes especially the old, reliable coil radiator cooling system with plenty of water. In it the cooling is a sure thing while the water lasts, and this indeed is its chief advantage, the water acting as a safety valve to all heat above the boiling point, while the radiator prevents the water from wasting away.

In such systems it is common to allow 4 or 5 square feet of radiation surface to each horsepower of motor. The proportion of surface on the fins to that on the pipes is 7 or 8 to 1. The efficiency of the fin surface, owing to small base and extended surface, must be quite low, probably not more than one-quarter that of the pipes for the same surface. The efficiency of such a system can be approached closely by air-cooling with good construction and small cylinders. The fins on an air-cooled cylinder, if of copper and ample and well connected at base, are possibly half as efficient as the walls themselves.

In the honeycomb system the water, with its contained heat, is minutely divided by a great number of small air pipes through which the cooling air is forced by a fan, and 5 or 6 feet of cooling surface is allowed per horsepower. Of course the efficiency of such a system is very great, and moreover, it does not depend on the speed of the car (or surrounding air), but is proportioned to the speed of the engine. With so much cooling surface it is not necessary for the air to pass through the tubes very fast, but it must move some, and it will not move, in this case, unless forced. Hence, the honeycomb cooler is at the mercy of its fan. Also, any loss of water is fatal.

Coming now to air-cooling, it is necesary, as before, to carry out the heat and distribute it over as great a surface as possible. In the absence of water, metal projections or fins on the cylinder walls are used. For this purpose copper is worth nearly six times as much as iron if its contact with the cylinder walls is good, but it is liable to expand away from the iron when hot. This heat is conducted out in proportion to the area of the base of the fin and, as it goes out considerably faster than it can be given off to the air, the fin may project more or less in proportion to the amount of air that can be brought in contact with its surface. The limitations to this construction are that as the cylinder size is increased there is so much more heat comparatively to the exterior wall surface that either there are not enough fins to carry it out, or they are so crowded together that the air does not circulate freely among them. It is, therefore, common practice with automobile builders to use a motor composed of several small cylinders, placed under a hood in front. The cooling air passing in at the open front of the hood must pass over and down behind the motor to get out. In this construction the air is somewhat confined and forced when the car is in motion, but only a small part of the air passing through the hood comes into actual contact with the cylinder heads; probably not a fourth of it. The air current naturally seeks the line of the least resistance, which certainly is not in among the fins; in fact, owing to the tortuous and obstructed way through the hood, the tendency is for the air to go around the whole engine. At any rate, the air speed through the hood is probably not more than half the speed of the car through the air, which on bad roads is not great. Then again eddies of hot air undoubtedly must form behind the cylinders and pipes and in various pockets of the mechanism. Without the hood, the conditions are likely to be still worse, the cool air being deflected from the front of the engine in proportion to its speed, leaving the sides and rear of the motor surrounded by following eddies of heated air and the cooling very uneven.

The writer's idea of air-cooling is more in line with the honeycomb system, but balancing against the large radiation surface a greater speed of air. As to construction, the fins and a jacket are so arranged as to form enclosed spiral passages around and down the cylinder walls, making the passages smooth and with no short turns, and forcing a current of air through them at considerable speed—say, forty to sixty feet per second. This would require but little force and the convection would be increased six or eight fold. It is true the air would come out considerably heated and would have to do part of its work while in that state, and it may be urged that it is not well to use a small and confined portion of heated air to do the work while there is all outdoors of cool, free air to draw from; but it may be answered that the free air will not do the work unforced, it must be brought into actual contact with the metal to cool it.

As a means for forcing the air through the passages, a fan could, of course, be used, but in the writer's opinion a better means would be, in a four-cycle motor, the use of the back of the piston as a pump. This would give a conveniently placed, positive and probably an ample force, with the great advantage of imposing no additional friction. To minimize the intermittent character of such a force there might be introduced in the base of the jacket a valve controlled outlet just beyond the pump inlet port, such valve being lightly balanced so that the air would open it and pass out by its momentum on the closing of the inlet. Furthermore, by arranging the pump outlet as an aspirator within the mentioned jacket outlet, the pump discharge might be made to assist in making the air flow continuous. These points are suggested because they admit of simple construction and would impose no load on the motor in operation. The writer can only guess at the efficiency of such a valve and aspirator, but they would at least be harmless.

Finally, it may be said that, compared with the methods before described, the con-

fined current cooling has some very distinct advantages. It is under control and will therefore cool when and where it is most needed, and its efficiency may be increased almost at will by giving greater speed and volume to the air. In short, since the cooling depends on the difference of temperature and the amount of contact between the air and the heated surface, and that surface is limited, *the greatest speed of air gives the greatest contact of air with the heated surface.*

It will at once occur to the readers of the above interesting article, that if the piston of a gas-engine be employed as a pump to force air around the cylinder, the piston will deliver only two stroke volumes of air for every charge of gas burned in the cylinder, or, in other words, two cubic feet of air for each cubic foot of gas. As the heat value of a cubic foot of gas, with wide open throttle, may roughly be assumed to represent 40 Centigrade thermal units, we may suppose that 40 per cent. of these, or 16, must be absorbed from the cylinder walls by, roughly, two cubic feet of air. The specific heat of air at constant pressure is 0.237, and two cubic feet at atmospheric pressure would weigh 0.156 pounds, so that the rise in temperature on absorbing 16 heat units would be $16 \div (0.237 \times 0.156) = 434$ degrees Cent., or 812 degrees Fahr., a temperature not far short of that of the cylinder walls themselves. The point is not essential to the value of the article generally, however.—Ed.

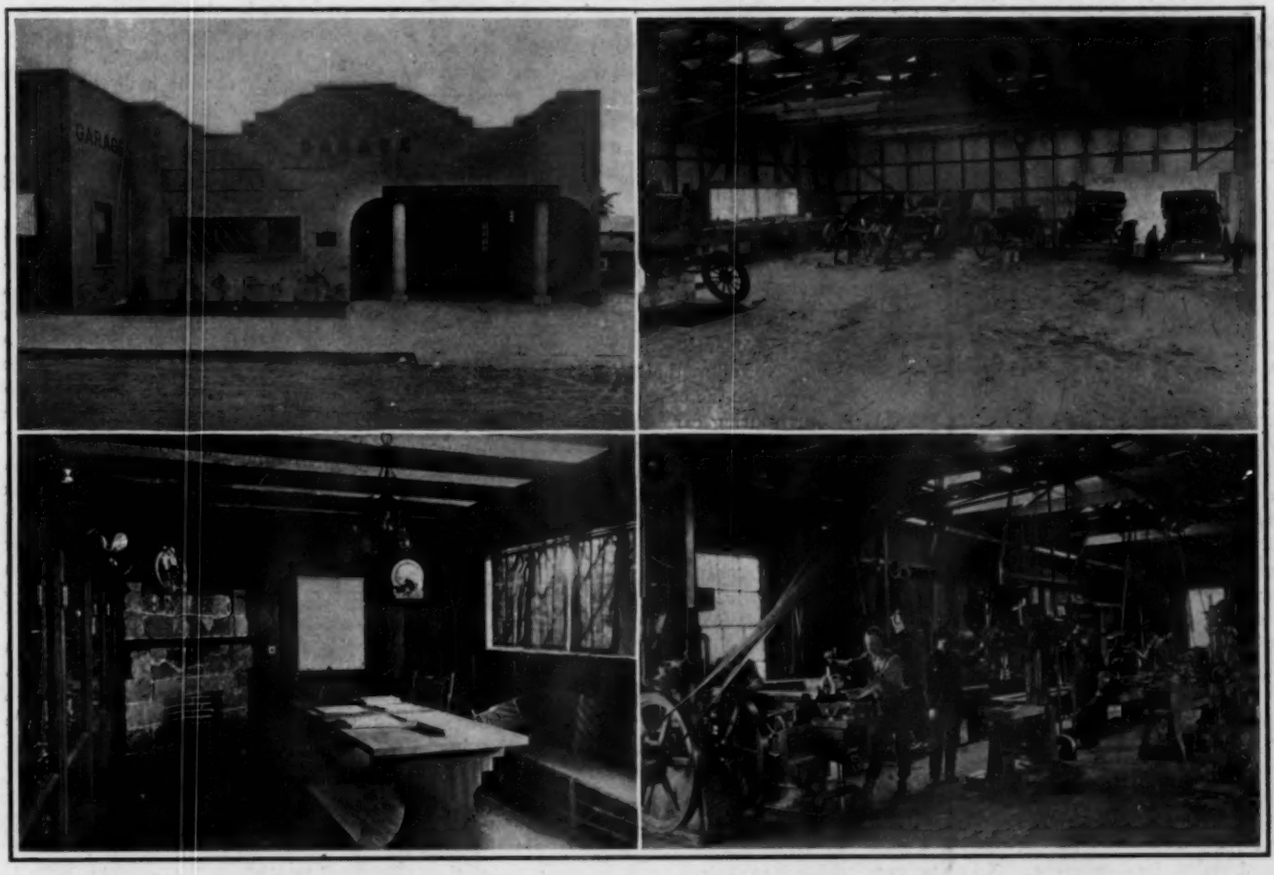
A Santa Barbara Garage.

The Harry Wood Machinery Company, of Santa Barbara, Cal., conducts a garage, illustrated herewith, that is very complete in its arrangement and equipment for handling and repairing automobiles. The main room, which is sixty feet square, is floored with cement and has an inspection pit illuminated by electric lights and long enough to take two large cars at the same time. A turntable is provided, which saves much of the space usually allowed for moving cars around. A revolving washer is used, and the installment of an air compressor permits the rapid and easy inflation of tires, cleaning of cushions and the drying of machines that have been washed. A 200-gallon gasoline tank is placed outside of the building, and fuel is piped into a rotary pump.

The repair shop has a complete equipment of machine tools, driven by a 20-horse-power gas engine. It is the shop used in the company's regular business of building machinery of various kinds.

The waiting room is a quaint apartment, having the appearance of being designed for solid comfort. In one corner is a massive sandstone and brick fire-place, for use when the weather is cold, while electric fans are ready at hand for sultry days. A massive table of redwood, finished in its natural color, is kept supplied with automobile publications, and at one end of the room is a desk, for the use of patrons, and a telephone. Along one side of the room is a glass case containing automobile accessories. Lockers are supplied, where owners and chauffeurs may keep their motoring togs and odds and ends.

The Wood company maintains an automobile livery at 25 West de la Guerra street, where cars and drivers can be hired at any time, day or night. The company has the agency for the Columbia and Autocar machines.



Front of Garage, Showing Main Entrance. Waiting Room for Customers. Storage and Repair Room, Showing Turntable and Pit. Machine Shop, Gas Engine Power.

EXTERIOR AND INTERIOR VIEWS OF SPECIALLY BUILT GARAGE IN SANTA BARBARA, CAL.

First-class cable, made especially for carrying ignition current, is rather expensive as compared with the ordinary styles of insulated wire, but is one of the best investments that can be made. By its use many troubles from leakage, broken wires and defective insulation are avoided. The amount of hard usage and abuse good cable will stand without deterioration is surprising.

Car Control by Spark and Throttle.

IN an automobile fitted with spark and throttle control the actual physical manipulation of the levers is simplicity itself, yet the positions of these levers exert a profound effect upon the working of the motor and the consequent running of the car. The effects produced by the simple movements of the levers cover the entire range of motor efficiency or inefficiency. This is assuming correct carburation at all engine speeds, either by automatic devices or by manually controlled supplementary air supply.

The immediately visible results in car or motor speed which gear changing produces are replaced in spark and throttle control by more subtle variations through an infinitely more delicate range of possible combinations or adjustments. Consideration of the subject has moved a correspondent in Sussex, N. J., to address the following query to this office:

"What is the correct way to start an automobile; to advance the spark first and then open the throttle, or the opposite? Also, in slowing down for a sharp turn or bad road, which is the better, to retard the spark first, or cut out the gas first?"

At first glance, the question seems a very simple one, and yet to answer it in a way that would be widely helpful would require a lengthy discussion of the different types of cars on the market and also their control systems. It is not difficult to see, for instance, that an Oldsmobile should be started in quite a different manner to a 90-horsepower Mercedes. Speaking generally, the correct way would be to advance the ignition first and then open the throttle afterwards.

Take the case of a runabout, with a single cylinder, horizontal motor and planetary transmission system. Suppose the car to stand on a good level road and with two persons of average weight in the seat. One way of starting a car under these conditions would be (assuming the motor is already running) to advance the ignition about half way, then open the throttle, and when the motor has picked up in speed throw the low speed clutch into operation. Now the car will move along on the low gear, and the next thing that may be done is to advance the ignition and open the throttle wide, waiting for a short time until the motor has reached its maximum speed, and then throw in the high gear. The effect of doing this will be to slow the motor down, and it will then be found that the ignition is too far advanced for the reduced engine speed. The early ignition will not allow the motor to develop full power and will also cause it to knock. A good driver, therefore, will retard the ignition the instant the high gear has been engaged. The best point at which to carry the ignition will have to be determined by the load on the motor, care being taken that the former is far enough advanced to keep up the motor speed, and yet not too far advanced to cause knocking in the engine.

A well trained operator would start his car in a slightly different way from that just described, for he understands that in order to insure long life to his motor it should be raced as little as possible. Put in other words, it means that the lower the speed at which the motor can be made to do the required work the better. A trained operator when starting will first advance his ignition, say about half way or a little further, next open his throttle, and before the motor has had time to race put in his low gear; gradually, so as to avoid putting a too sudden load on the motor. When the car has attained the speed which the ignition and throttle opening allow, the high gear would be engaged, not too suddenly nor yet too slowly, the object sought being, as before, to prevent a too sudden load on the motor and a consequent slowing down of the latter.

The ignition next should be advanced to the best running position and the throttle opened sufficiently to give the desired speed. If it is required to go faster, the throttle should be opened more and the ignition advanced to follow the higher motor speed.

Now take the case of a 4-cylinder vertical motor touring car, with sliding gear transmission system. Supposing the motor is running slowly, the operator engages his low gear, speeds the motor up slightly, if the latter is powerful, and faster if it is of low horsepower. The clutch is next allowed to go in, gradually in all cases, and the car moves ahead. The manner of changing from the low speed to the next higher will depend on the power of the motor, on the type of clutch, and also on the control system of the motor. With a high-powered car it will not be so necessary to race the motor on the low gear before changing into second as it would be if the motor was of low power. In the other case, unless the motor was well accelerated on the low gear, so as to get the car moving smartly, the sudden load will tend to slow down the motor so much that it might not be capable at the reduced speed of developing sufficient power to drive the car on the second gear, and might necessitate a change back into first.

A high-powered motor, say, from 30 horsepower upwards, will be easily capable of taking care of the load thrown on it when the gear is changed from a low to a high one, even when the motor is running at its normal speed, which would be around 1,000 revolutions per minute.

Another factor which will influence the method of starting a car, as has already been stated, is the type of clutch. Some clutches, especially metal ones, have a decided tendency to "grip" suddenly when engaging. Clearly it would be bad practice to speed the motor up and then have the clutch to grip violently, as the result would be to accelerate the car abruptly or to de-accelerate the motor, or, mayhap, to do both. For the reasons just mentioned, it is best when starting a car with a clutch which takes hold suddenly, not to speed the motor nor to allow the clutch to engage violently. The proper motor speed is that which will just get the car moving nicely from standstill. This motor speed will be found by experience.

Still another factor to be considered when starting a car is the method of motor control. Usually a car which has a governor fitted to its motor can be started without accelerating the motor above its normal or governed speed. An exception would be in a case where the motor was low powered, say, less than 12 horsepower, when the accelerator would probably have to be used in order to prevent the motor from being stalled. Usually, however, when the motor is of more than 12 horsepower, the accelerator will not have to be used, unless the load on the car is excessive or the start is made on an upgrade or on a bad road.

When a car is not fitted with a governor it is usually "tricky" to drive, and it is also more difficult to manipulate when starting. The reasons are not far to seek. A motor controlled by a hand or foot operated throttle will have to be kept running at its normal speed by closing the latter. Now a very slight amount of throttle opening will be sufficient to supply enough gas to keep even a large motor turning over 800 to 1,000 revolutions per minute.

Assume that the low gear is meshed and the motor throttled so as to run at normal speed, or possibly a little less, so as to avoid a too sudden start. Now when the clutch is allowed to engage it slows down the motor and probably will stop it altogether unless the throttle is quickly opened. However, opening the throttle suddenly, especially at a low engine speed, tends to upset the carburation unless the carbureter is absolutely automatic, which is seldom the case. Further, the defective carburation and the reduced engine speed consequent on the improper mixture will again pull down the speed and power of the motor, which may stop as a result. For this it will be evident that with an ungoverned motor a number of quick movements will have to be made if the motor is to be prevented from being stalled every time a gear is changed, especially from a low to a higher.

A car fitted with two speeds usually will call for more careful handling when starting from a standstill. More flexibility will be required in the motor if the car is to be handled as readily as another car fitted with more than two speeds. In explanation it may be said that the low gear on cars which have only two speeds is usually higher than the same gear on cars having more than two speeds. This is necessitated by the very

nature of the arrangement. If the low speed were as slow as it would be on a multiple speed car, then when a grade was encountered, which the car could not take on the high gear, the low would have to be used. The latter being very low, it would be necessary to race the motor in order to go ahead at a greater speed than a walking pace. For this reason two speed cars have their low speed faster than the corresponding speed on a three or four speed car.

This being the case, it is easy to see that a much greater effort is required from the motor when starting a two speed car from standstill, and the clutch must be allowed to slip for a longer time than would be necessary on cars with more than two speeds. Consequent on the necessity of allowing the clutch to slip is the liability to stop the motor by a too sudden engagement of the clutch.

Again, on account of the great difference of speed between the low gear and the high in two speed cars, the clutch usually will have to be slipped when changing into the high from the low.

From these remarks it will be evident that when a car has few speed changes, the clutch, or clutches, will require more manipulation than the gears, while the opposite is true when the car has several speed changes.

Now in two speed cars it follows that in order to operate them easily the motor is called on to vary in speed between very slow and very fast. To be capable of doing this the motor must be supplied with the correct mixture of gas and air, which necessitates an automatic carbureter or its equivalent. In cases where the carbureter is not entirely automatic, or is automatic only within certain ranges of motor speeds, the operation of admitting supplementary air may be accomplished by a manually operated valve or shutter. It is quite a knack to operate this shutter properly, as it has to move when the motor speed increases or decreases greatly. As more supplementary air should be admitted at high speeds than at low speeds, the handle must be moved in the proper direction to produce this result. When the motor is slowed down the handle is moved in the opposite direction.

In this connection it is well to remember that although a motor may be turning at, say, 300 revolutions per minute, it might require a greater supply of supplementary air in one case than it would in another, the speed remaining the same. In order to understand why this is so, it will be necessary to look into the action of the carbureter briefly. Suppose the motor when driving the car is turning over at 300 revolutions per minute, and suppose that the throttle is wide open and that the load on the motor prevents it from turning faster than 300 revolutions per minute. The more intense the suction is in the nozzle chamber, the more gasoline in proportion to air will be delivered in a given time, or the richer will be the mixture. Consequently, the more intense the suction the more the demand for supplementary air. The intensity of the suction depends on two things: first, on the speed of the motor; and, second, on the amount of throttle opening. For instance, in the case of the motor just cited, the throttle being opened wide, the intensity of the suction will be maximum for that particular speed. For this reason the supplementary air ports will have to be opened wider than they would be opened if the motor were running idle at the same speed. In the latter case the throttle would be almost entirely closed, and the amount of air passing through the carbureter a minimum. Consequently, the demand for supplementary air is less because the intensity of suction is less. From this it may be seen that a motor revolving at a constant given speed will require a different regulation when running without load than it will when running with a load.

Although explaining carbureter action may seem a far way from describing the proper way to start a car, it will not be difficult to perceive from what has been said that the two are intimately connected.

Regarding the right and wrong way of starting a car which is fitted with a non-automatic carbureter, it may be said that the wrong way is to speed the motor up without moving the supplementary air handle before engaging the clutch. If it is attempted to speed the motor without regulating the air valve, the motor will misfire and cannot be speeded as high as it might if the supplementary air was correctly regulated.

Again, a mistake may be made easily in forgetting to regulate the air after the clutch has been engaged. The motor will be slowed down by the imposition of the sudden load, more or less depending on its size. If the supplementary air was correctly adjusted for the high motor speed, it would not be correct for the low motor speed, due to the load. Consequently, variations in the motor speed will have to be quickly followed by readjustment of the air valve if the maximum power of the motor is to be obtained. This would evidently be the correct way to handle a car with a non-automatic carbureter. When slowing down, the throttle should be closed first and the ignition retarded afterwards.

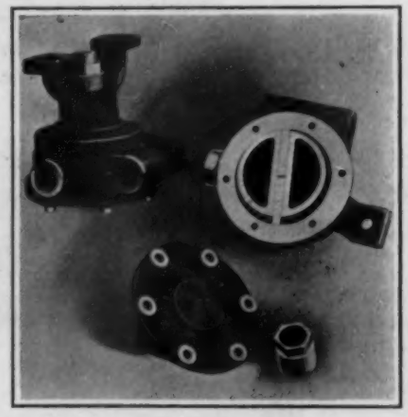
The degree of spark retardation will depend on how slow the engine is required to be run while the clutch is disengaged and the car running on its own momentum. When a car is fitted with a governor, the lowest speed at which a motor runs is usually regulated by the governor. As the normal or running speed is fairly high on a governed engine, it follows that the ignition will not have to be retarded as much as when a governer is not fitted to the motor.

Again, the amount of advance and retardation of the ignition need not be so great with a governed motor as with an ungoverned one, for the reason that the former will not be required to vary between such a wide range of speed as the latter; in fact, on some cars the ignition is set for the best running position and not moved at all.

From the foregoing it might appear that the driving of a car in the right way is very difficult. Such, however, is not the case. With a little practice and a little patience the various manipulations will be accomplished intuitively—almost unconsciously.

ECCENTRIC CIRCULATING PUMP.

The accompanying engraving shows the exterior and interior of the rotary pump used in the circulating system of the Northern light touring car, manufactured by the Northern Mfg. Co., of Detroit, Mich. The revolving disk, which is set eccentrically, is of bronze, as are also the two sliding vanes, which bisect the disk and are kept constantly in contact with the periphery of the chamber in which they move by means of brass springs. One of the side openings shown is the water inlet and the other the outlet. The drive is by a shaft which passes through the stuffing-box seen between the arms of the bracket, by which the pump is attached. The cover is a close fit against the revolving part of the pump, and is secured to the flange by six screws.



NORTHERN ECCENTRIC CIRCULATING PUMP.

A. Conan Doyle has gone automobile mad. His frenzy is not, however, likely to prove fatal, to himself or to others, because of the good care he is having, during the first paroxysms of the disease, from his mother. When the automobile mania seized Dr. Doyle she felt that duty called her to his side. When he wanted to take a spin in his machine she took her courage in her hand and climbed into the front seat with him, and placed a cautioning finger upon his arm as he opened the throttle. And now the chickens, and the sheep, and the cows of the country round live in peace, for they know that they have nothing to fear from the snorting machine with the sweet-faced, gray-haired little woman by the driver on the front seat, for they will have plenty of time to get out of the way.—*Minneapolis Tribune.*

Peerless 35-Horsepower Touring Car.

THE Peerless 35-horsepower touring car, built by the Peerless Motor Car Co., of Cleveland, O., is a large, roomy automobile with ample power for all road conditions, luxuriously upholstered side-entrance body, and large tires to carry the weight easily. The motor, which is exactly like all other Peerless motors, except in point of size, is a reduced facsimile, the manufacturers state, of the 60-horsepower engine of the Peerless *Green Dragon* racing car; the 60-horsepower Peerless touring car has a motor which is said to be identical with that of the racer. The 35-horsepower car has shaft and bevel gear drive, and a sliding gear transmission of the selective type which provides four forward speeds and a reverse, with direct drive on the high gear. Among the features of the mechanism may be mentioned the babbitt bearings in the motor and transmission gear, which are made by a special process; and the adjustable ball bearings in the road wheel hubs, the bevel driving gear and differential.

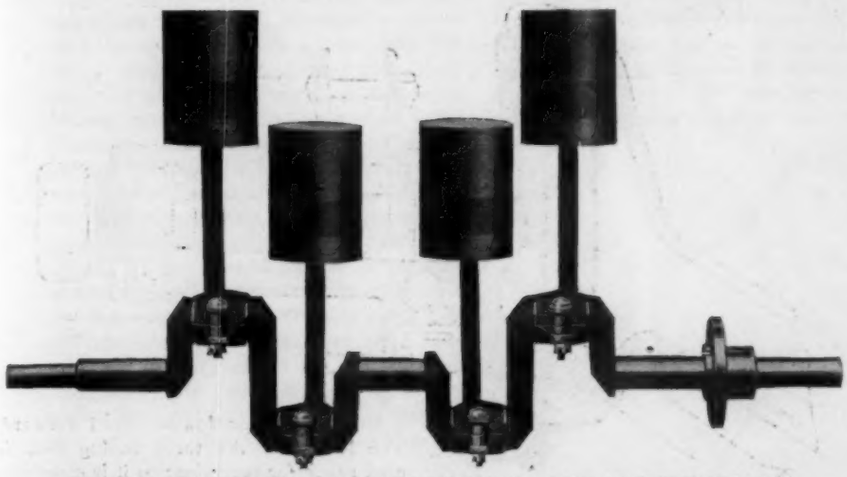
The pressed steel frame is of the channel section generally adopted by builders of large cars, the side members being heaviest in the center and tapering toward the ends, where the spring hangers are attached; but the conventional form of frame is departed from in that the side members are parallel throughout their length instead of being offset near the front. A deeply dropped rectangular sub-frame, also of pressed steel, is hung within the main frame, supporting the motor and the transmission gear case, which are secured to the sub-frame by means of bolts passing through lugs or arms cast on the cases in the now familiar manner.

The cylinders of the motor are cast in pairs with their heads and water jackets integral; the jackets, as the illustration shows, extend well down over the barrels. All valves are mechanically operated and open directly into the cylinder heads, the main object of this arrangement being the cutting down of the area of heated surface with which the incoming charges of gas must come in contact. By keeping the fresh gas comparatively cool, its excessive expansion, previous to ignition, is avoided and the expansive power of the charge for a given bulk kept at the highest possible point. Each valve is placed in an individual cage; a cage, with valve and spring in place, is shown in the accompanying photograph on page 535. The valves are actuated through rocker-arms pivoted on brackets attached to the cylinder heads. The rods through which motion is transmitted from the cams to the rocker arms; the joints between the rods and the rocker arms; the pivot pins; and the rocker arms themselves are all case hardened. Adjustment of the rods for length is obtained by threading the rods into the knuckle stubs, lock nuts being provided to hold them.

The somewhat peculiar form of the cylinder casting is due to the fact that the 1905 Peerless motors were designed to use a supplemental exhaust port, uncovered by the piston during the lowest portion of its stroke, in addition to the usual exhaust valve, a passage cast on the cylinder connecting both exhaust openings with the exhaust pipe, which is attached to a flange at the bottom of the passage. In the motors being turned out at present the supplemental exhaust port is not used, the exhaust being disposed of in the usual way through the mushroom valve, except that the gases pass down through the passage to the exhaust pipe instead of going straight out into the pipe. This is merely a temporary arrangement, pending some improvements in the application of the supplemental exhaust port which are in progress at the factory. All valve-operating mechanism is on the left-hand side of the motor, the single shaft which carries both intake and exhaust valve cams being driven by wide-faced bronze-and-fiber gears. A pinion meshing with the camshaft gear drives the centrifugal circulating pump through a shaft; the pump is placed on the crankcase at about the center of its length and to the left of the cylinders, as on the Mercedes motor; the radiator is of gilled tubing. A grooved aluminum pulley for the fan belt is secured to the crankshaft just outside the two-to-one gearing.

PEERLESS 35-H. P. TOURING CAR, FITTED WITH EXACT COPY OF "GREEN DRAGON" ENGINE EXCEPT IN SIZE.

Four packing rings are fitted to each piston, each ring being placed in a separate groove; three are near the top of the piston and the fourth a little above the center. Below the lower ring the piston is relieved, for a short distance, and in the bearing surface at the lower end of the piston oil-retaining grooves are turned. Steel drop forgings are used to make the connecting rods, which are of I-section. The axes of the cylinders do not coincide with the centers of the crank-pins; therefore, an expedient is adopted which is frequently used by builders of motors and gives very satisfactory results. The connecting rods do not join the "big ends" at the center, but sufficiently to one side to allow for the difference of alignment of cylinders and cranks; the accompanying engraving on page 535 shows the arrangement clearly. Heavy bolts with castellated nuts secure the big end bearing caps in place; the bearing itself is of babbitt. Solid bronze bush-

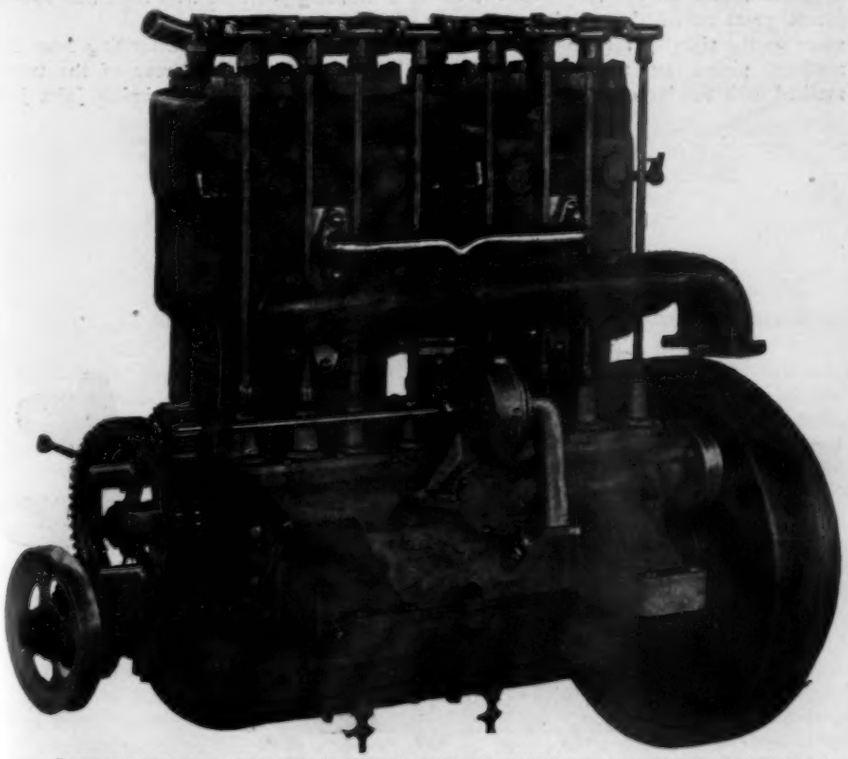


ASSEMBLED CRANKSHAFT, PISTONS AND CONNECTING RODS OF PEERLESS ENGINE

ings are fitted in the piston pin ends of the connecting rods.

The drop forged steel crankshaft has all superfluous metal cut away from the web corners; the three main journals and the crank-pins are ground and casehardened. Babbitt is used for the main bearings as well as for the crank-pin bearings, the metal being poured in hot; compressed to fill the shell at all points and to close up the pores and machined. The final operation consists of hand-scraping the bearings until they fit their journals and pins exactly. The three crankshaft bearings are supported from the upper half of the horizontally divided aluminum crankcase, so that by removing the bolts holding the halves of the case together the lower half can be dropped, leaving the cranks exposed for inspection. Lubrication of the main bearings is effected by forced feed, in addition to which the splash from the crankcase insures a supply of oil as long as any remains in the crankcase. Splash is relied upon to lubricate the working parts of the camshaft.

Ignition is by jump spark, the standard equipment consisting of high-tension magneto, driven by gears from the half-time shaft, the machine furnishing all the ignition current necessary, without the use of batteries or spark coil. The usual equipment of batteries, coil and distributor will, however, be supplied as an option. An automatic carbureter of the float feed type is fitted on the right-hand side of the engine, gas being carried to the cylinders through the siamese pipe seen in the engraving. The motor has a bore and stroke of 4 5-8 inches and 5 1-2 inches, respectively, and is rated at 35 horsepower.



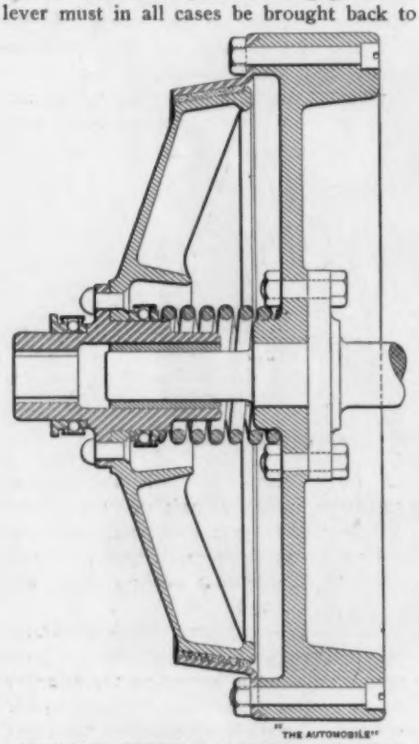
PEERLESS ENGINE, SHOWING ROCKER ARMS AND RODS FOR ACTUATING VALVES.

A hub and flange are formed integral with the rear part of the crankshaft of the motor, and the flywheel is fitted over the hub and bolted to the flange with finished steel bolts; a steel flange for the clutch is bolted to the rear side of the rim of the flywheel. The clutch is of the conical type, with leather facing, and exerts no external end thrust when engaged, the engaging spring being located between the hub of the flywheel and that of the clutch. When the clutch is out of engagement the thrust of the spring is taken on a ball-bearing collar mounted on the clutch hub. The clutch is controlled by the usual pedal, and is released automatically upon the application of either of the brakes. In the rear end of the clutch hub is formed the square hole which constitutes the outside member of the slip-joint required at this point to permit the clutch to move back and forth. Into this hole the squared end of the first gear shaft, projecting from the transmission gear case, is slipped; this construction gives as much play as is necessary, together with a positive drive, and is extremely simple.

ASSEMBLED VALVE AND CAGE.

The change-speed gear is well illustrated in the engraving on page 536, and is a good example of what is known as the selective type of sliding gear; four forward speeds are provided, with direct drive on the highest speed, and a reverse, all controlled by one lever. The two shafts are arranged in the usual way, the shaft shown uppermost in the engraving being divided, the portion on the left with squared end carrying the two pinions on the left-hand side, and telescoping over and forming a bearing for the right-hand part of the shaft, which is squared, and upon which the sliding gears travel. The right-hand end of this shaft, outside of the gear case, carries one-half of a universal joint, the propeller shaft carrying the other half. The two sliding gears on the right are mounted on one hub and slide on the squared shaft together; the third, counting from right to left, is on its own hub, moving independently of the other two. Each hub is provided with a collar for a shifting fork of the usual type. Three steel bars of rectangular section, seen at the top of the engraving, are free to move longitudinally in slots cut half in the lower portion of

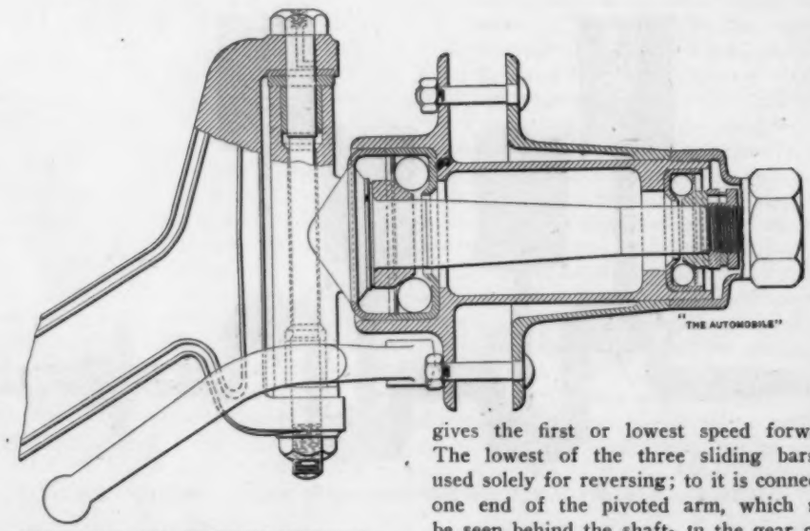
the gear casing and half in the upper portion. To the top bar is rigidly secured the shifting fork for the single gear; to the second the fork for the two gears, which slide together, and the third operates the arm that shifts the reversing pinion, which is the wide-faced pinion below the secondary shaft on the right-hand side. Each bar carries at one end a pair of jaws resembling the jaws of a monkey-wrench, but immovably fixed on the bar. The inboard end of the gear-shifting shaft carries a finger, which can be moved into the jaws of any desired bar by a lateral movement of the gear-shifting lever. When the lever is moved backward or forward the shaft is partially rotated and the finger on its end moves the bar with whose jaws it is engaged. The lever must in all cases be brought back to



PEERLESS INTERNAL CLUTCH, WITH SELF-CONTAINED THRUST.

the neutral position before a new set of gears can be engaged, for it moves in a slotted plate, a slot being provided for each sliding bar. Moreover, the shifting finger cannot be moved until the three sets of jaws are in line, as shown in the engraving.

With the motor running, the gears in the position shown in the engraving and the clutch engaged, the car would not be driven; the countershaft would revolve idly, none of its gears being meshed with the sliding gears. If, however, the finger on the shifting shaft is moved into engagement with the jaws of the top sliding bar, and the single sliding gear caused to move to the left, this gear will telescope over the pinion next to it, as it is formed into an internal gear just large enough to admit the pinion, thus forming a positive clutch, with one member on each section of the divided

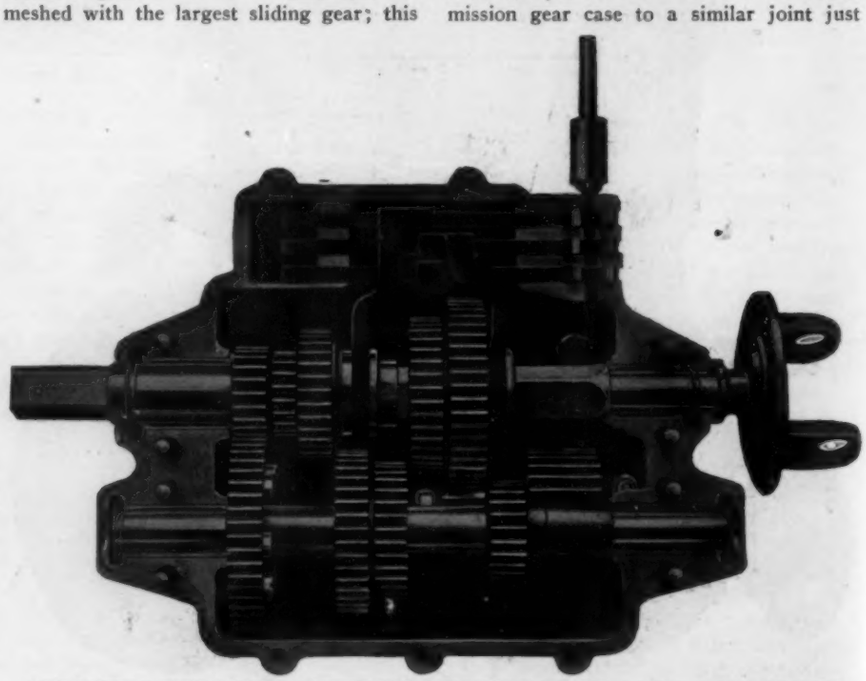


FRONT HUB AND STEERING KNUCKLE.

shaft. Thus the shaft is caused to rotate as if solid, and the motor drives direct to the propeller shaft, the countershaft revolving idly. A movement of the same gear to the right of the neutral position brings it into engagement with the second gear from the left on the countershaft. The drive is now from the pinion on the first shaft to the gear on the countershaft, giving a considerable reduction in speed, and from the second gear on the countershaft to the single sliding gear which drives the squared shaft carrying the universal joint, the double sliding gears meanwhile rotating with the shaft without doing any work. To throw in the second speed the middle sliding bar is engaged and the sliding pair of gears moved to the left until the adjacent gears mesh. By moving the same gears to the right of the neutral point the smallest pinion on the countershaft is meshed with the largest sliding gear; this gives the first or lowest speed forward. The lowest of the three sliding bars is used solely for reversing; to it is connected one end of the pivoted arm, which may be seen behind the shafts in the gear case, the other end of the arm carrying a fork by which the wide-faced reversing gear is slid on its stationary shaft. When all gears are in the neutral position the reverse pinion may be slid to the left far enough to engage both the pinion on the countershaft and the largest sliding gear, thus giving the latter a reverse motion.

Babbitt bearings are used in the transmission gear case, these being made in the same manner as the motor bearings. Oil is thrown on the bearings by thin rings which revolve with the shafts and dip into oil contained in pockets cored in the case. Oil from the gear case is liable to contain a good deal of finely divided metal ground from the gear teeth, and is therefore not allowed to lubricate the shaft bearings, these being provided with their own special lubricant.

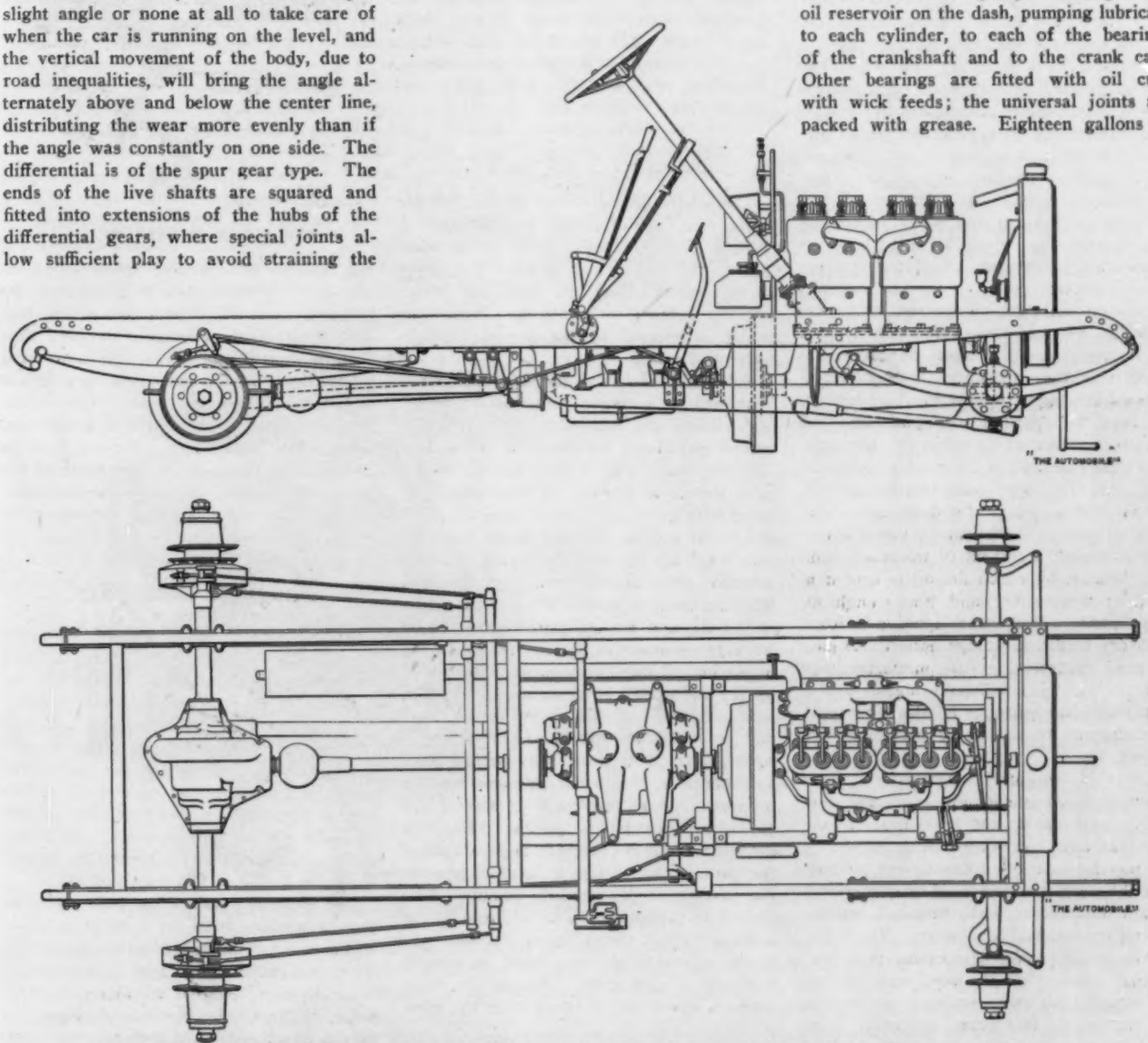
The propeller shaft, extending from the universal joint at the rear of the transmission gear case to a similar joint just



"SELECTIVE" TYPE GEARING, GIVING FOUR FORWARD SPEEDS, DIRECT DRIVE ON HIGH.

in front of the case containing the bevel gears and differential, is intended to lie with its axis practically in line with the motor shaft, the transmission gear shaft and the short shaft carrying the bevel pinion, when the car is normally loaded. Thus the universal joints will have only a slight angle or none at all to take care of when the car is running on the level, and the vertical movement of the body, due to road inequalities, will bring the angle alternately above and below the center line, distributing the wear more evenly than if the angle was constantly on one side. The differential is of the spur gear type. The ends of the live shafts are squared and fitted into extensions of the hubs of the differential gears, where special joints allow sufficient play to avoid straining the shafts if the rear axle springs slightly. The outer ends of the live shafts are squared also, fitting into outside driving caps having castellated flanges interlocking with corresponding castellations in the rear wheel hubs, the wheels revolving on ball bearings on the outside of the axle sleeve. When the cap is screwed home a short helical spring presses against the end of the live shaft, preventing it from rattling about endwise. Ball bearings are used throughout the differential and rear axle.

Two pairs of brakes are fitted, all working on drums secured to the hubs of the rear wheels. The ordinary service brakes, operated by pedal, consist of bands encircling the drums, while the lever operated emergency brakes are expanding rings inside of the same drums. In this way the gearing and shafting are relieved of all braking strain, and the braking is done close to the point where it is required.



SIDE ELEVATION AND PLAN DRAWINGS OF CHASSIS (WITHOUT WHEELS) OF PEERLESS 35-HORSEPOWER TOURING CAR.

The front springs are 36 inches long and the rear springs 48 inches long, the latter having more of their length forward of the rear axle than behind it, and the forward part more flexible than the rear portion. This method of hanging the rear springs is meeting with much favor, being used by a number of manufacturers.

The steering gear is of the thread and nut type, and is, of course, irreversible. Throttle and ignition controlling levers are mounted on the top of the wheel, where they work over notched sectors as usual.

The front axle is made from a heavy steel forging of I-section, and is particularly strong close to the knuckles, where there is a heavy strain. Elliot knuckles are used, heavy and set close to the wheels. The front wheels, as well as the rear, run on ball bearings; all the ball bearings used about the car are adjustable for wear.

The force-feed lubricating system embodies a set of oil pumps working in an oil reservoir on the dash, pumping lubricant to each cylinder, to each of the bearings of the crankshaft and to the crank case. Other bearings are fitted with oil cups with wick feeds; the universal joints are packed with grease. Eighteen gallons of gasoline can be carried in a copper tank located under the front seat.

The wood artillery wheels are 34 inches in diameter, front and rear; the front wheels are fitted with 4-inch tires, while 4 1-2-inch tires are used on the rear wheels. The wheelbase is 104 inches and the tread standard. The weight, with empty tanks and without extras, is 2,700 pounds. Bodies are made of stamped steel and finished in a dark green, which is the standard Peerless color, the striping being black, with a fine line of gold. Cars, when sold, are equipped with oil side and tail lights, acetylene gas headlights, set of tools and an assortment of spare small parts.

Rainier 22-28 H.P. Car.

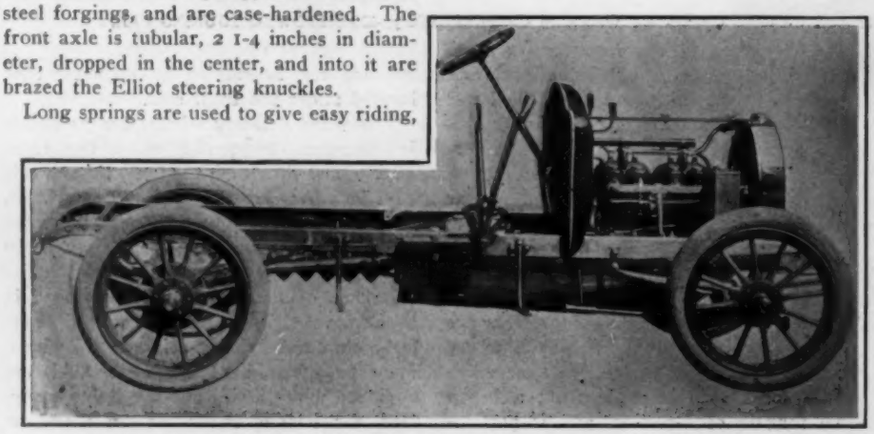
A new car has recently been placed on the market by the Rainier Company, of Broadway and Fiftieth street, New York, after having been put through a series of tests covering a period of several months. The illustration herewith gives a good idea of the general appearance of the chassis.

Frames, cross members and sub-frames are of pressed channel steel. The vertical four-cylinder motor is hung low in the front and covered by an oval bonnet, being protected underneath by a steel pan which extends back to the rear end of the transmission gear case. The cylinders are cast in pairs, with heads and water jackets integral, and the valves, all of which are mechanically operated, are placed symmetrically, exhaust valves on the left and inlet valves on the right. Bore and stroke are 4 inches and 4½ inches, respectively, and the motor is rated at 22-28 horsepower at 1,000 revolutions a minute. A peculiar feature of the motor is that the bearings are hardened and ground steel bushings; and similar bearings are used in the transmission gear case and in the road wheel hubs.

A Hill Precision oiler, ratchet driven, supplies lubrication for the motor and transmission gears; the lubricator is placed where it will receive a current of warm air from the radiator, by which the oil is kept at a uniform temperature and thin enough to flow readily. Jump-spark ignition is fitted with dry batteries, storage batteries or mechanical generator, as the purchaser may desire. Water is circulated by a gear-driven centrifugal pump through a Briscoe radiator. A carbureter of the Krebs pattern is employed.

Drive is through a leather-faced cone clutch, three-speed sliding-gear transmission and propeller shaft and bevel gears to the live rear axle, the wheels being driven by the popular castellated driving-cap method. The differential is composed of spur gears; an aluminum cover, easily removed, exposes the differential and bevel gears. The lower portion of the bevel gear casing is a steel casting, into which the steel axle sleeves are brazed. All gears, except those driving the cam shafts and pump, are made from steel forgings, and are case-hardened. The front axle is tubular, 2 1-4 inches in diameter, dropped in the center, and into it are brazed the Elliot steering knuckles.

Long springs are used to give easy riding, those in the rear being 45 inches long and 2 inches wide, while the front springs are 40 inches long and 1 3-4 inches wide. The brackets by which the springs are hung on the side frames are steel forgings, as are all brackets attached to the frames. The chassis weighs 1,520 pounds, and the car complete, with body, 2,000 pounds, with empty tanks. The wheelbase is 98 inches; tread standard. Thirty-two-inch wheels, front and rear, are shod with 4-inch imported tires.

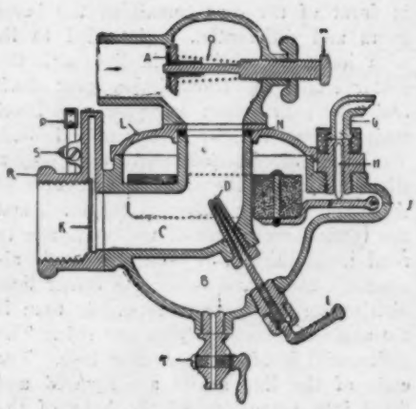


CHASSIS OF RAINIER CAR, WITH DUSTPAN UNDER ENGINE AND GEAR BOX.

Schebler Carbureter.

One of the strong points of the Schebler carbureter, manufactured by Wheeler & Schebler, Indianapolis, Ind., is its simplicity; this may readily be seen by a glance at the accompanying line engraving, showing the carbureter in section. Automatic action is secured by the use of a single valve and spring.

Admission of fuel to the float chamber is regulated by a hinged cork float of horseshoe shape, the admission valve *H* being raised and closed as the level of gasoline lifts the float. The float is heavily coated with shellac to prevent its becoming saturated with gasoline. The spraying nozzle *D* enters the mixing chamber at an angle, so that it will act correctly, no matter in which direction air is passing through the passage. This has made it possible to place the throttle on top and the air admission valve on the side (opposite to the way shown in the engraving) if more convenient. The action of the carbureter is so simple as to need little explanation. Air enters the air inlet and at low motor speeds passes the automatic valve *A* through the opening seen just under it, this being sufficient for the purpose. As the throttle *K* is opened and the motor demands a greater volume of air, the valve *A* is opened by suction against the pressure of spring *O* until it permits the passage of the requisite amount. The tension of the spring can be adjusted by the screw *M*, and the adjustment, once obtained, is held by screwing home the winged lock nut on this screw. The needle valve through which fuel is admitted to the mixing chamber is adjustable by the little handle *E*. The drain cock *T* permits of the disposal of any sediment and water that may collect in the bottom of the cup. The throttle is of the gate type, and is operated by the lever *P*, the movement of which is adjustably limited by stop *S*. The small size and light weight of the Schebler carbureter are good points; and the location of the spraying nozzle in the center of the gasoline chamber renders its action independent of the disturbing influences of changing grades.



NEW SCHEBLER CARBURETER.

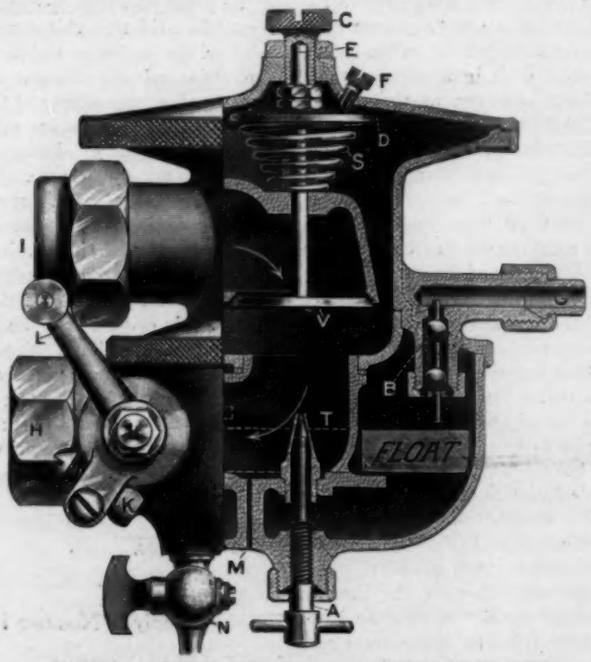
Kingston Carbureter.

The Kingston carbureter of the 1905 model shows a number of changes from the older forms, introduced with a view to making the apparatus more nearly automatic in operation, more reliable and less affected by road conditions. The accompanying engraving shows the carbureter partly in section, giving an idea of its external appearance, as well as showing the disposition of the working parts. The Kingston carbureter is manufactured by Byrne, Kingston & Co., of Kokomo, Ind.

The spraying nozzle *T* has been placed in such a position that the level of gasoline within it is not influenced by grades of the road, its location within a horseshoe-shaped float chamber being at an almost neutral point, so far as change of level caused by hills is concerned. A copper-sheathed cork float follows the contour of the float chamber, and is allowed to rise and fall only at one end—the end visible in the engraving—the other, constituting the two points of the horseshoe, being prevented by flanges from rising. The opposite or free end rises as fuel flows in through the fuel pipe *G* until it raises the stem of ball valve *B*, shutting off the flow of gasoline until the level falls, when the descending of the float allows the valve to again open by its own weight. A needle valve of the usual type is provided for the adjustment of the flow through the spraying nozzle, the handle *A* projecting below the carbureter. A drain-cock at *N* is used for drawing off sediment, water and other foreign matter which may be trapped in a cup formed for the purpose in the

bottom of the gasoline chamber. A small hole *M* is drilled into the bottom of the mixing chamber, its purpose being to allow the excess of gasoline to drip out when the carbureter is flushed before starting the motor; in this way the operator is given an ocular demonstration of the fact that the fuel is flowing as it should, and at the same time the excess of fuel, required only for a moment, is carried away.

Automatic action is secured in the Kingston carbureter without the use of auxiliary air ports, a single inlet pipe, *I*, admitting all the air used. Arrows in the engraving indicate the course of the air after it enters the carbureter. A throttle *J* operated by lever *L* regulates the amount of gas admitted to the motor supply pipe; *K* is a low-speed stop, arresting the movement of the throttle lever at the point desired and preventing further throttling down. A screw adjustment is provided so that this point may be varied to suit the motor.



KINGSTON CARBURETER FOR 1905, PARTLY IN SECTION.

The automatic action of the carbureter is secured by means of the valve *V* and its accessories. A spring *S* tends to hold the valve on its seat, while the suction of the motor, exerting a pull in the opposite direction, tends to open it, compressing the spring. As, however, the movements of the valve under these two opposing forces would be too rapid and violent, a restraining influence is introduced by inserting a membrane *D* in a wide, shallow chamber formed for the purpose, the edges of the membrane being clamped by the screw cover, while the valve rod passes through its center and is clamped to the membrane by nuts and washers. This forms an air-tight chamber in the top of the carbureter. If no opening were provided for the ingress and egress of air the valve would have but a very slight movement; so a small air inlet is made, and its size can be regulated by means of the screw *F*. This leaves the valve free to respond to the pull of the motor and of the spring, but forces it to move steadily and more or less slowly, according to the rapidity with which the air is allowed to pass through the inlet hole. The space beneath the membrane is in communication with the mixing chamber, and so the diaphragm is directly affected by the suction of the motor; its area is so large that it will respond and assist in opening the valve when the motor is running at very low speeds, thus avoiding wire-drawing. A hollow screw *C* forms a guide for the top of the valve stem, and at the same time limits its upward movement. When correctly adjusted the valve does not quite close, but leaves a small opening through which air may pass. The hollow screw provides a means of exactly adjusting the amount of this opening. A jam nut *E* secures it against jarring out of adjustment.

When the carbureter is to be adjusted to a motor, the throttle is opened wide and the motor is run at high speed, the needle valve *A* being adjusted until the mixture is correct. The throttle is then closed until stopped by the stop *K*; if this causes the motor to run too slowly, or stops it altogether, the adjusting screw is brought forward until the desired rate of speed is secured. When running in this position the mixture (correct for high speed) will be too rich, which is corrected by pushing the valve *V* away from its seat by means of the adjusting screw *C*, until the freer admission of air by valve *V* reduces the suction at the spray nozzle to the point suited to the speed of the engine. Having correct high-speed and low-speed adjustments, the mixture should be correct at intermediate speeds. If the motor seems to respond sluggishly to the opening or closing of the throttle, the air inlet *F* must be adjusted to admit air a little faster, and *vice versa*. The manufacturers recommend that the air be taken from some warm place, as, for instance, a point close to the exhaust pipe.

English Auto Truck Rules.

Motor vehicles for carrying or hauling heavy loads are now so much used in this country, writes Consul Frank W. Mahin, from Nottingham, England, to the State Department, that their operation is closely guarded by government supervision. A section of the motor act of 1903 provides for suitable regulations as need may develop. As the result of inquiry and investigation by a committee of the department, the local government board promulgates certain new rules, taking effect to-day (March 1), but giving six months' grace for necessary alterations in existing motor vehicles.

Hitherto the legal weight limit of an empty motor car has been three tons. Now it is raised to five, with an increase in the legal joint weight (unladen) of a motor car and trailer from four to six tons. Heretofore there has been no legal weight limit to the load on a motor car, but the new regulations aim to prevent excessive loading. The total weight of car and load is limited to twelve tons. The weight borne on any axle shall not exceed eight tons. The weight on any axle at any time is not to be allowed to go beyond the weight accepted, as for that axle, at the time of the registration of the car, such accepted weight for the axle being termed the "registered axle weight." As to the relationship between the limitations of twelve tons and eight tons, it is noted that the greater part of any load, approximating to two-thirds of the whole, may ordinarily be expected to be carried on the axle to which the driving power is directly applied.

Special and detailed provision is made for securing a width of tire duly proportionate to the moving load and the size of the wheels in cases where the wheels are fitted with ordinary tires, *i.e.* tires which are not pneumatic or are not made of a soft or elastic material. No ordinary tire is, however, to be less than five inches in width.

A heavy motor car (over two tons' weight unladen) is restricted to eight miles an hour, or to five miles an hour if the car exceeds in weight three tons unladen, or has any axle with an axle weight exceeding six tons, or draws a trailer; but to this rule there are exceptions allowing somewhat higher speed to cars having pneumatic tires or other tires of a soft or elastic material.

The axle weight on any axle of a trailer is limited to four tons. If the trailer exceeds a ton in weight unladen, the provision as to the proportionate width of tires applies; but a minimum width of three inches is allowed.

Letter Box

Motor Indicator Diagrams.

Editor THE AUTOMOBILE:

[187].—I was much interested in "Subscriber's" letter in the April 22 issue of THE AUTOMOBILE, commenting on Professor Hutton's lecture before the N. Y. Motor Club; but it seems to me that your correspondent has made a mistake in his premises, and consequently in his conclusions. "Subscriber" evidently takes it for granted that the Professor's remarks applied to a high-speed motor of the automobile type, running at 1,000 or 1,200 revolutions a minute; whereas the engine referred to is, I believe, of the slow-speed stationary type, running at about 250 revolutions a minute—a very different proposition, so far as the points under consideration are concerned. Taking indicator diagrams from such a motor presents no special difficulties. The indicator used is not, of course, the standard steam engine instrument, with a piston having an area of one square inch. The gas engine indicator, in its usual form, has a piston area of one-quarter of a square inch and the moving parts are of extreme lightness. With such an indicator and a slow speed motor there is no difficulty in obtaining good, practical cards.

Referring to the indicator diagrams published in connection with "Subscriber's" letter, it seems to me that the obliquity of the combustion line in Fig. 1 is somewhat exaggerated for the purpose of illustrating the fact that the process of combustion is not, as many suppose, instantaneous, but requires an appreciable amount of time for its completion. With ignition late in the stroke, combustion proceeds as the piston is moving away from the cylinder head at constantly augmented speed, giving an explosion line (or more properly speaking, a *combustion* line), whose obliquity would become greater as the charge was fired later. The same effect would be produced by increasing the rotative speed of the crank-shaft and, consequently, the piston speed, the speed of flame propagation remaining constant while the piston speed varies.

The Professor's statement that an advanced spark constitutes a "good motor brake" holds good with regard to the slow-speed motor under consideration, because the speed of combustion is so great with relation to the slow piston speed that the piston can move through only a small portion of its stroke before the maximum pressure is reached; and if this point is attained before the piston commences the power stroke, the motor will be retarded by the back pressure. The same is true of the high-speed motor; but ignition must occur much earlier in the compression stroke to produce retardation. If, with the high-speed motor, combustion commences exactly at the commencement of the power stroke, the piston will have moved through a considerable portion of its stroke before maximum pressure is attained, and the full benefit of the expansion will not be obtained. With ignition occurring a little before the compression stroke is completed the charge rises to maximum pressure just as the piston starts on its power stroke, if ignition is correctly timed. It is obvious, however, that it is only necessary to advance the spark far enough to cause maximum pressure to be attained before the end of the compression stroke in order to interfere seriously with the speed and power of the motor. That this is the case is only too well known to all automobilists who have advanced their ignition too far for the momentary speed of the motor, causing the unmistakable and disagreeable "pound" that occurs under such circumstances.

Referring to Fig. 2; is there not a mistake somewhere? Your correspondent refers to area H having been given as "a negative to be taken from area C in estimating the mean effective pressure," with ignition occurring at B. If ignition occurred at that point giving the line O Z, there would not be any area H. As a matter of fact, the ignition line would not be perpendicular, even theoretically, but would be a curve extending from O to X, its form depending upon so many complex conditions as to be entirely problematical. The form of the curve would be altered by the piston speed, the heat losses through the cylinder walls, the quality of the gaseous mixture and other conditions, all working together, so that it will readily be seen that even an approximately correct guess is out of the question.

As to taking cards from high-speed gasoline motors, I believe the nearest approach to success in this direction has been attained by a German investigator, who used a delicate and complex photographic apparatus. Even this was not of much practical use, however, and for every-day use the Prony and the rope brake remain the best available means of ascertaining the horsepower of fast-running gasoline motors; the dynamo, which is practically an electric brake, is also used for this work.

I am greatly interested in this matter, and agree with "Subscriber" in hoping to see further discussion of the points raised. The matter is one whose importance can hardly be overestimated, in view of the "arrival" of the gasoline motor.

ANOTHER SUBSCRIBER.

New York.

Editor THE AUTOMOBILE:

[188].—I read with a good deal of interest "A Subscriber's" letter on questions of horsepower, and thought I might clear up some of the points that seemed to trouble him. In the first place, "Subscriber" seems to have some doubt as to the practicability of taking indicator diagrams from gasoline engines at high speeds with ordinary indicators. In this he is about right; in fact, the indicator is almost unknown to the automobile engine designer, who depends mostly on the brake and a "cut-and-try" method to find the faults of his design as to port areas, types of valves, and so on. Within the past year or so some of the European manufacturers have been experimenting with methods of obtaining indicator diagrams which would seem susceptible of obtaining good results at almost any speed. These methods are very interesting, but I have not time to go into them here. The main use of the diagram is to determine errors in the design of an engine; such errors, for instance, as valve ports of insufficient size, too low a compression, faulty ignition timing and so on. I believe that from the interest "Subscriber" has shown that he would feel amply repaid for the expenditure of time if he would read Chapter XIV of Roberts' Gas Engine Handbook.

As to the effect on the power of the motor of the point at which sparking takes place, it may be said that this depends upon the speed of the motor and also on the rate of combustion of the charge. If our motor were running very slowly or the combustion of the charge were instantaneous, then the right place to ignite the mixture would be on the centre. As, however, the charge takes an appreciable time to get fully ignited, this time depending on the nature of the charge, its temperature and the degree of compression, it is necessary to ignite the mixture before the centre is reached in order to get the best results at high speeds. While a diagram taken at high speed would undoubtedly have considerable area cut off owing to spark advance, yet this loss of area would be much less than that which would be occasioned by firing the mixture at a point which would be suitable for slow speeds.

HAROLD H. BROWN.

Boston, Mass.

Reply to Number 179.

Editor THE AUTOMOBILE:

[189].—Replying to the letter of G. W. S. in your issue of April 8, under the heading, "More Power Needed," it appears that the data is somewhat meager for a full examination of the conditions, but the main query is simply this:

With the throttle one-quarter open, 750 revolutions are obtained. With the throttle wide open fifteen to twenty-five revolutions additional are obtained. Why?

It must not be forgotten that this is a boat problem, and that the engine is turning a propeller. This means that with increase of revolutions there comes increase of resistance and increase of power at a much more rapid rate than would be accounted for by the increase of revolutions alone. The increase in revolutions seems to be about 3 per cent. This means with the propeller and boat an increase of about 6 to 8 per cent. in mean effective pressure and of 10 or 12 per cent. in power. The real question, therefore, is: Why does the engine, between one-quarter and full

throttle, give an increase in mean effective pressure of only 6 or 8 per cent., with a corresponding increase of power of 10 or 12 per cent.

Without a more intimate knowledge of the design and proportions of the engine, only general reasons can be hazarded. The following facts, however, are evident: (1) Either the increase in throttles does not give corresponding increase in explosive mixture, or, (2) if the gas is introduced its quality is not up to the standard, due possibly to improper proportion of air; or, (3) if the gas is introduced and is of standard quality, then its full effect is not realized, due to some combination of causes which do not appear in the statement of the problem.

The most probable suggestion seems to be the first. This may be due to throttling in the passages or at the inlet valve, so that the one-quarter throttle represents nearly all the gas which the inlet valve or passages will comfortably accommodate. The statement is made that the increase of noise at inlet and exhaust is evidence of increase in the amount of gas admitted. Sound, however, is not always a sure indication in such matters, and it might be that the increase in the amount of gas entering is hardly proportional to the apparent increase in sound. There seems to be but slight ground for assuming an improper proportion of air, having in mind the careful adjustment of the gasoline needle valve which seems to have been made.

There is no apparent reason for ascribing the trouble to the propeller. No statement is made as to how the propeller is working with regard to speed, slip, etc., but the small increase in revolutions between one-quarter and full throttle can hardly be charged to the propeller direct. If it is already too small it would certainly not prevent increase of revolutions with increase of mean effective pressure. If the diameter were increased it would reduce the revolutions for the same turning moment, and therefore reduce the work per minute for the same work per revolution. There would be no apparent object in this. If the pitch should be increased, much the same result would follow, with presumably increase of propeller slip and loss of propulsive efficiency.

The only condition for which the propeller might with advantage be increased in diameter lies in the possibility that the gas inlet passage is much too small for 750 revolutions of the engine. In such case the gas would be seriously throttled at the higher revolutions, while at lower values fuller charges might be introduced; and at some point a combination of explosive charge and revolutions might be found which would give more power, more speed, and a more consistent increase of both with opening of the throttle.

By way of final suggestion it would be well to ascertain by careful measurement of the gasoline from a special tank improvised for the purpose, if necessary, just what is the increase of gasoline consumption between one-quarter and full throttle.

Again, if the engine could be readily uncoupled from the propeller shaft, a rope brake or other simple form could be adjusted to the fly-wheel, and it could then be readily determined whether or not with constant resistance the engine would respond to additional throttle beyond 750 revolutions. W. F. DURAND.

Stanford University.

Gasoline Consumption in Steamer.

Editor THE AUTOMOBILE:

[190].—I have purchased a light steam car, about which I would like to ask a few questions. The machine appears to be in good order, but the boiler does not make steam as it ought. I had to turn on the gasoline so as to use a gallon and a half for running a little over a mile. What average amount of fuel should it take for average roads? G. W. B.

Sparta, Mich.

There is certainly something very much the matter with your steam-generating plant, and it seems probable that the flues are so filled up with soot that but little heat is transmitted to the water. With everything as it should be, you should make on level roads about ten miles to a gallon of gasoline—the amount increasing, of course, if the road is bad or hilly. Are you sure all the gasoline is being burned, and that there are no leaks?

One Day's Shipment of Autos.

Editor THE AUTOMOBILE:

[191].—We have sent you, under separate cover, a photograph showing the largest train load of Ramblers that has ever left our factory, and it consists of one day's output. You will note that there are fourteen freight cars full, and we think it represents the largest single day's shipment of automobiles ever made in this country.

The destination of each car is on the card, which, however, is only readable a part of the way down, owing to the length of the train and the consequent distance at which it was necessary to take the photograph. The loading platform was photographed immediately after, showing that all of the cars had been pulled out.

THOS. B. JEFFERY & CO.,
G. W. Bennett, Sales Manager.

Kenosha, Wis.

Wear of Ball Bearings.

Editor THE AUTOMOBILE:

[192].—While undoubtedly it is a useful thing to know how to correct wear in plain and roller bearings, yet on the other hand it is undoubtedly better to arrange so that the wear will never be large enough to be of any consequence; in that way the trouble, annoyance and cost more or less incidental to taking up wear will also be avoided.

With plain journals this can be done by making them large enough; but even in ordinary machinery it is rarely possible to distribute the pressure over a sufficient area to realize this, and this is far truer with regard to the cramped space available in designing an automobile. With roller bearings the difficulty of employing sufficient dimensions to insure the practical absence of wear is rather less, but still, as is abundantly proven by experience, there is plenty of room for improvement, and in corroboration of this statement I refer to an article on page 469 of THE AUTOMOBILE of April 8, 1905.

In my opinion, ball bearings offer a solution. I have had occasion recently to examine some bearings taken from the rear hubs of Mercedes cars, the owners of which vouch for mileages of 40,000, 52,000 and 65,000. These bearings are of the German D. W. F. make, which are now made in this country. Actual measurement shows a radical wear of the four bearings of only .0006, .002, .002 and .0025 of an inch—the worst case thus showing a wear of a quarter of a hundredth of an inch. In the direction of the axis the wear amounted to .015, .022, .032 and .028, in no case more than a little over three one-hundredths of an inch. Considering that these bearings had not only to

TRAIN OF FOURTEEN CARS LOADED WITH RAMBLER AUTOMOBILES—ONE DAY'S SHIPMENT FROM JEFFERY FACTORY AT KENOSHA.

sustain the direct weight of the cars, but were also subjected to considerable end thrust due to track racing and high-speed work, this is a decidedly interesting showing, the more so in that there was no visible evidence of wear of either balls or rings, such as rough spots, grooves, pits or bands on the balls; and the bearings are apparently good for many miles more.

A. HEGARDT.

Philadelphia, Pa.

Hot Air in Advertising.

Editor THE AUTOMOBILE:

[193].—A large number of automobile manufacturers are prone to talk about their competitors; that is, in their advertising matter. Why do they do it? Why all this knocking in the automobile business? Do they imagine that by pointing out the weak points in other makes of automobiles that they are furthering their own make?

We read in one advertisement that "A regular stock model ——— car taken from any garage will easily excel in speed, hill-climbing or endurance, any regular stock model of its horsepower made in this country or Europe, regardless of make or price." This is a broad statement. It was taken from the advertisement of what the writer has always supposed to be a first-class automobile. Is it possible that the manufacturers of this automobile are short-sighted and are endeavoring to deceive themselves by believing that there is anybody so ignorant as to believe the statement in their advertisement? It is doubtful; but why do they permit the knocking?

In another advertisement we read that "Mr. Blank was and is the most successful gasoline motor designer in the United States; he built the first practical gasoline ——— ever known." There are several men in this country who make the same claim. We will suppose, for argument's sake, that any one of the half dozen making claims to being "the first," "the pioneer," and many other phrases too numerous to mention, is entitled to the claim. Is this any reason why his machine is any better than many others?

One foreign built car advertisement is very nicely worded until very near the end, when the writer thereof, who probably imagined that the advertisement would not be complete or convincing unless he got his little hammer working, finally exploded as follows: "Some unscrupulous dealers in American cars will tell you that you cannot obtain repair parts for imported cars." If the "unscrupulous dealers in American cars" cared to get out their little hammers, they could very conveniently quote the above, and add, "if the cars were properly built they would not need any repair parts."

There is need for the automobile manufacturers to put a stop to this continual knocking. There is enough business for all if it is not killed by continually calling attention to each other's defects. Let a campaign of educational advertising be started by all the automobile builders in America, and it is safe to assume that not one of them would be able to fill his orders the first year, so great would be the demand.

The man who has never owned an automobile needs to be educated. At present he is timid; he has read so many conflicting advertisements regarding the merits of this car and the demerits of all other cars—all in the same advertisement—that he makes up his mind not to buy an automobile until such time as they get beyond the "experimental stage." The experienced automobilist can no longer be tempted by big advertisements and hot air. He has undoubtedly had his little experience and paid for it, too. The next time he buys an automobile he will look over every part carefully, and will buy the machine which in his judgment is best suited to his requirements. No amount of hot air is going to tempt the man of experience a second time. He knows his little book too well for that. Not so, however, with the man who has never owned an automobile. It is educational advertising only that will ever tempt him to buy an automobile.

The writer is acquainted with a gentleman who sold his entire stable, consisting of several horses and vehicles, with the intention of buying an automobile. A large number of manufacturers demonstrated their cars for his benefit, and almost invariably, so he told me, each one pointed out some slight discrepancy in his competitor's car. The result was that the man has not bought an automobile to this day, and that was nine months ago. As he expressed it, "I was so damned bewildered by what I was told by each concerning all others, that I made up my mind to wait until automobiles were perfected before I bought."

If the automobile manufacturers do not get together and start an educational advertising campaign, they will be the losers. If present conditions are allowed to continue, they should, at least, "get together" and appoint a censor on all their advertising copy.

ANDREW A. RUSSELL.

Cleveland, O.

Prohibitive Ordinance in North Carolina.

Editor THE AUTOMOBILE:

[194].—Enclosed please find an ordinance just passed by the county commissioners of Vance county, N. C. There are but three automobiles in the county and the ordinance was passed with a view not only to restrict the ones now here, but practically to prevent any more being brought here.

The automobile owners intend to test the ordinance and would ask you to furnish us with cases that have been tried in other state that might help us in taking the matter up with the Supreme Court of North Carolina.

C. H. T.

Henderson, N. C.

The ordinance reads as follows:

WHEREAS, the General Assembly, at its session in 1905, passed an act permitting the county commissioners of various counties of the State of North Carolina to regulate the speed of automobiles, motor-cycles and other like vehicles, on the public roads and bridges, and to make such ordinances as they deem necessary governing the same; and making the violation of such ordinances a misdemeanor punishable by fine not exceeding fifty dollars, or imprisonment not exceeding thirty days. Now, therefore, pursuant to said act, the Board of Commissioners of the County of Vance do ordain:

SECTION 1. That no automobile, locomobile or motor cycle, shall be run or driven on or over any of the public roads or bridges in the county of Vance at a greater rate of speed than three miles an hour.

Any person violating this ordinance shall be guilty of a misdemeanor, and upon conviction fined or imprisoned as set forth in the above named act.

SECTION 2. It shall be the duty of all persons running or driving any automobile, locomobile or motor cycle on any of the public roads of Vance county, as permitted in Section 1 thereof, to keep a lookout for persons riding or driving on said public roads, and who are meeting or approaching them, and if any such persons so riding or driving shall signal the person or persons running or driving the automobile, locomobile or motor cycle, by holding up their hand, the person or persons in charge of or running or driving the automobile, locomobile or motor cycle, shall at once turn to the right on said road, stop their machine, dismount and stop the engine or other power which runs the same until the person so signalling shall have safely passed.

Any person violating this ordinance shall be guilty of a misdemeanor, and upon conviction fined or imprisoned as provided in the act of the General Assembly above referred to herein, in the preamble.

This ordinance shall be in force from and after the 10th day of April, 1905.

We are unable to cite any decision in a suit brought to test such an ordinance as this, but the courts have held in a number of cases that the automobile has an equal right on the public streets and roads with all other sorts of vehicles, and it seems likely that an ordinance as palpably intended to deny the reasonable use of the roads to automobiles as this could be fought successfully on the ground of its unconstitutionality as class legislation.

In the issues of THE AUTOMOBILE for November 26 and December 3, 1904, we published excerpts from decisions in a number of suits that might have weight with your county commissioners.

The pneumatic headgear that has been used by foreign racing motorcyclists has been eclipsed by a complete pneumatic suit recently evolved by some genius. It matters not what may happen, a motorcyclist wearing such a garment is safe. If he is thrown into the road he will merely bounce around until he settles down; if he falls in the water he will float like a balloon; if he is run over his costume will cushion the weight of the wheels, and so on. But the designer seems to have forgotten that there is danger of puncture. Doubtless when these garments become fashionable there will be an immediate demand for anti-puncture overcoats, in the pockets of which quick repair outfits will be stowed.

Small Inventors' Show at Paris.

(Continued from page 525.)

13, comprises a cylinder with a jacket similar to the usual water-jacket, but through which only air passes; on the cylinder walls, within the jacket, are corrugations for increasing the radiating surface. The exhaust gases are discharged through a short pipe *E* which is within a large tube *T* communicating with the jacket of the cylinder; the principle is that of the ejector. On the opposite side of the jacket is a large opening *O* for the admission of cold air. When the motor is in operation the exhaust gases, rushing from the exhaust pipe and through the large tube, induce a strong current of air through the jacket, thus cooling the cylinder by the contact of the cold air. It is said that this arrangement makes the use of a muffler quite unnecessary, as the noise of the exhaust is deadened by the volume of air with which it mingles in passing through the pipe.

A number of exhibitors who could not afford to have models of their inventions made, or whose devices were too large for convenient exhibition, showed only drawings. Among these was the De Buissy driving system, an improvement on the double cardan shaft drive first conceived by Bollée. Fig. 14 shows the arrangement very clearly. Both differential and change-speed gears are contained in the casing *D*, and the drive is through bevel gears and pinions *B B* and *C C*, shafts *P P* and pinions *G G* to bevel gears *E E* on the rear wheel hubs. While this drive apparently has the

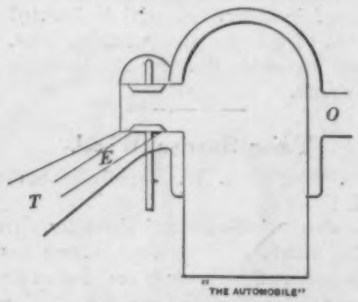


FIG. 13. VIAVANT AIR COOLING SYSTEM.

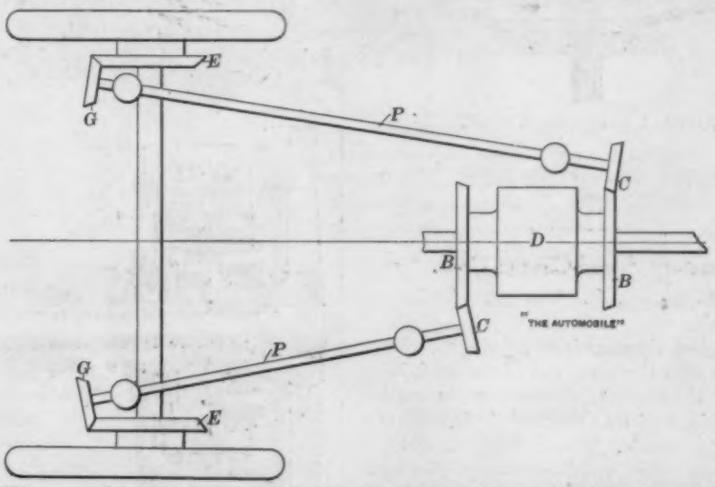


FIG. 14. DE BUISSY BEVEL GEAR AND SHAFT DRIVE WITH DEAD REAR AXLE.

advantages of the side chain drive in that there is a solid axle, and of the ordinary shaft drive in that there are no chains, it would probably be very expensive to build, and it is not likely that its efficiency would be high. The inventor's opinion of it, however, is only limited by his capacity for believing in the child of his brain, and the sign on his exhibit makes extraordinary claims for the device.

The ever-present gasoline turbine is represented by a complicated arrangement of four cylinders of the usual type and a blade turbine. The pistons draw in gas in the usual way, and this is ignited and at the same instant permitted to escape when the compression stroke is three parts completed, the out-rushing gases striking against the vanes of the turbine.

The beautiful confidence of the inventors in their ideas, even when these ideas were of the most impracticable nature, was in many cases actually distressing, when one considers that in many instances the best years of a lifetime had been spent in the endeavor to perfect some absolutely useless device. It was the impression of every visitor at the show that never before had such a vast representation of misery and unknown misfortune been placed before the public; and many feel in their hearts, who do not dare to say it openly, that such a show will never again be held. All these impressions are condensed into the expression of one visitor, who said: "I came here to see the machines; but I have seen much more of the sufferings of those who have made them."

All this may well be put to the fault of the exhibitors themselves. These men have such unbounded faith in their inventions and the fortunes they will bring when they are appreciated, that they can speak for hours on the subject to anyone who will listen. Very few of them have any mechanical training, and it makes it still sadder to hear them telling of their dreams, of their efforts, of everything concerning themselves, mixing with their demonstrations the most elementary mistakes, which, were they not self deceived, their own common sense would expose to them. Some, however, do not correspond with this sad description; for they are clever, trained men, and these usually have the means to carry on their work.

AUSTRALIAN RELIABILITY RUN.

Tie Between Nine Clean Score Makers Settled by 140-Mile Day's Run.

As nine competitors in the Australian reliability trials, out of thirty-five starters, made perfect scores, it was necessary to arrange for a special run from Melbourne to Ballarat and back, a distance of seventy miles each way, to decide the tie. This was run off on March 6. The story of the main run was told in THE AUTOMOBILE of April 8.

At the conclusion of the actual trials the cars and motorcycles were taken in charge by the Dunlop Tire Company officials, who promoted the event, and those who were eligible for the final were not given their machines until five minutes before starting time, when the following competitors lined up: Heavy cars—H. L. Stevens, 12-14-h.p. Darracq; Sidney Stott, 12-h.p. Decauville; W. S. Ross and H. Tarrant, Argyll 10-h.p. cars. Light cars—J. G. Coleman, 7-h.p. Swift; J. H. Craven and S. H. Day, 8-h.p. De Dion cars. Motorcycles—B. James, 1 3-4-h.p. Minerva; V. H. Bard, 3 1-2-h.p. Brown.

The only machine that made an actual non-stop run was the 10-horsepower Argyll of H. Tarrant, who won the event, lifting two trophies, the Garland cup and the Buchanan cup. The former becomes the property of the winner, while the latter is held for twelve months.

B. James won the Kemsley trophy in the motorcycle class on a motor of 1 3-4 horsepower, his opponent's motor being rated at just double this power.

The trophy for light cars, presented by Robert Hurst, was won by J. H. Craven, driving an 8-horsepower De Dion. Coleman and a cow had a dispute as to the right of way, and the automobilist had to stop for repairs; Stevens' ignition current short-circuited and the car was put out of the running. All the others finished within the time limit.

Stott was put out of the race, so far as winning was concerned, by an act of sportsmanship and humanity. The motorcyclist who acted as official observer to Gard got a bad fall; Stott stopped to render assistance and carried the observer, who was painfully injured, to the town. As a result, he was the last to finish.

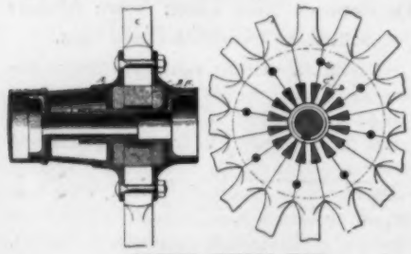
It is said that for the first time in the history of the race, the donor of the cup, James Gordon Bennett, will witness the competition this year over the Auvergne course.

Patents

Wheel Hub.

No. 787,564.—J. C. Couper, of Flint, Michigan.

The essential feature of this hub is that the spokes are shouldered and tenoned, as at *C*, and the tenons enter a solid block *B*,



COUPER WHEEL HUB

presumably of cast steel, which slips over one of the hub quills *F* and is held by the flanges *A*, as shown.

Speed Indicator.

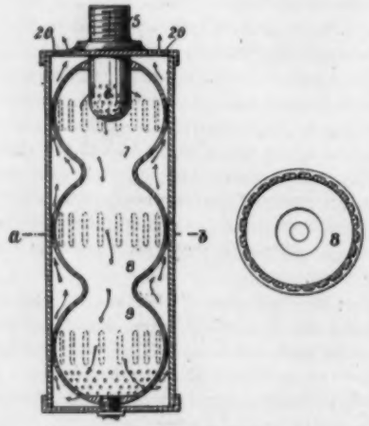
No. 787,650.—E. T. Turney, of San Rafael, California.

A small air pump driven by a friction wheel from one of the road wheel hubs supplies air to a sort of bellows which acts on a needle in a dial indicator. The air escapes through a small orifice whose opening is adjustable for the purpose of calibrating the indicator.

Muffler.

No. 787,860.—N. W. H. Sharpe, of London, England.

The exhaust gases enter by the pipe *5* and escape through the perforations *6* into the



SHARPE MUFFLER.

chamber *7*, *8*, *9*. At the end of *9* they escape by the perforations into the surrounding annular spaces, and pass out finally at *20*. The intention is to check the velocity of the gases by alternate expansion and contraction. The small view is a cross section on the line *a b*.

Automatic Spark Control.

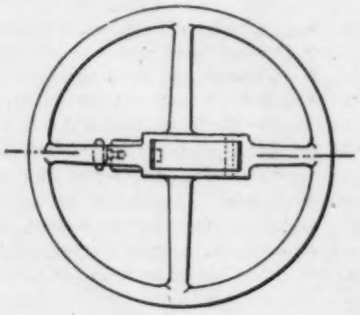
No. 787,212.—J. W. Packard, of Warren, Ohio.

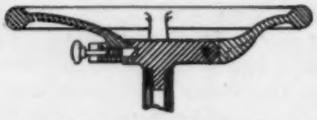
This is a spark timing cam slidable on its shaft and controlled by a centrifugal governor substantially as in the Packard cars of two or three years ago. The cam, however, is in this device made part of the circuit, which it closes by making contact at the proper time with the contact spring. A segment of insulating material is inserted in the toe of the cam at the leaving edge, to secure a positive time for the breaking of the circuit.

Tilting Steering Wheel.

No. 787,471.—C. W. Russell, of Springfield, Ohio.

A wheel of the general character shown in the sketch. The steering column has a T-shaped head at its upper end, with a pivot





RUSSELL STEERING WHEEL.

in one branch and a socket engaged by a snap latch in the other.

Planetary Speed-Change Gear.

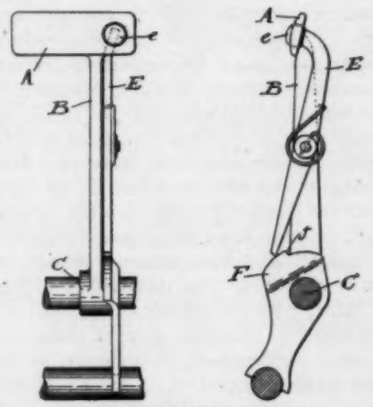
No. 786,939.—G. R. Albaugh, of Cleveland, Ohio.

The object aimed at is to get the sprocket pinion *11* near the outer end of the shaft instead of close to the flywheel as in most transmissions of this sort. This is accomplished by securing it to a sleeve *8*, which carries the low speed planetary pinions *14* and is connected also to the internal gear *16*, which is rotated in the reverse direction by pinions *18*, after the latter are rendered stationary by tightening the reverse friction band *23*. With this arrangement all the gears may be enclosed in an oil-tight case *37*.

Locking Pedal.

No. 787,530.—H. G. McComb, of Ardsmore, Pa.

A pedal consisting of a wide pad *A* on the arm *B* attached to shaft *C*. When the pedal is pressed forward the pawl *E* drops into the notch *f*, and is held there until the foot is pressed on the button *e* to release it. Thus by connecting this pedal with the flywheel clutch the latter may be released



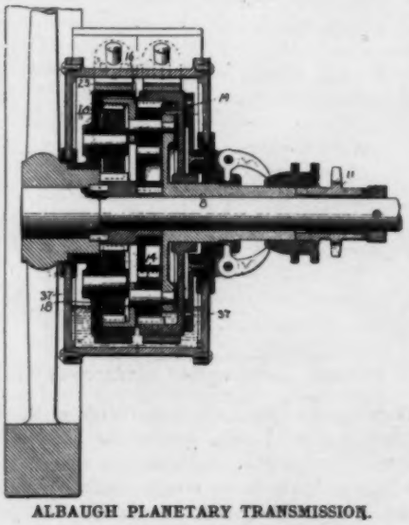
McCOMB LOCKING PEDAL.

irrespective of the application of the emergency brake.

Power Transmission Mechanism.

No. 784,285.—T. L. Sturtevant, of Quincy, and T. J. Sturtevant, of Wellesley, Mass.

A modification of the Sturtevant automatic multiple speed clutch described in connection with the Sturtevant car in these pages some months ago. As will be remembered, this clutch comprises a set of individual multiple disk clutches enclosed within the flywheel and actuated by centrifugal weights attached to the flywheel. Thus with a moderate engine speed the low speed clutch is first engaged, and with a suitable increase of speed the high speed clutch is likewise engaged, and a roller



ALBAUGH PLANETARY TRANSMISSION.

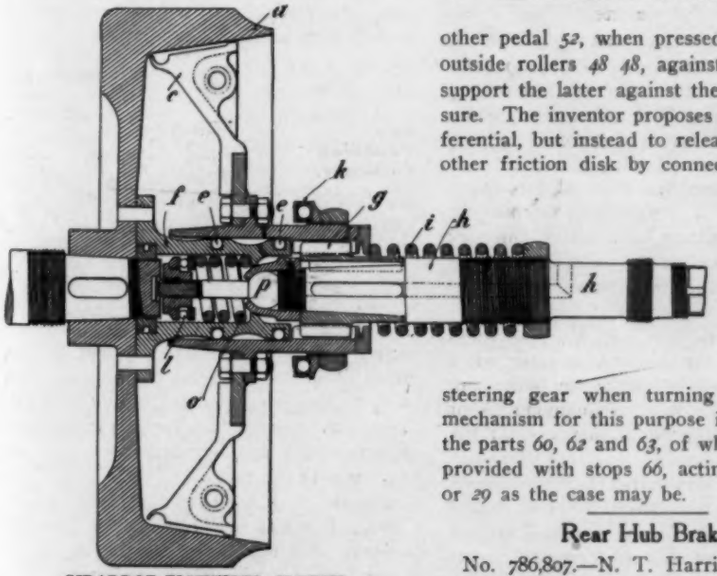
ratchet in the low speed gear permits that gear to overrun. The modification consists in an attachment whereby, when the moment of resistance of the load increases beyond the carrying capacity of the engine, when the drive is in high speed, the drive

will be transferred to the low speed clutch by release of the high speed clutch, without requiring the engine to slacken for this purpose.

Flywheel Clutch.

No. 787,031.—L. Girardot, of Puteaux, France.

This is a clutch in which the conically driven member *c* is maintained concentric with the flywheel *a*, and the driven shaft *h* is allowed to depart somewhat from alignment with the crankshaft, by means of a special arrangement of parts. The clutch member *c* run on ball bearings *e e* on an extension *f* of the flywheel hub, and is released from engagement by pressure backward on the ball thrust collar *k*. It is maintained in normal engagement by the compression spring *i*, whose rear end abuts against a collar threaded on shaft *h*, which turns with *c* at all times, being connected to it by the loose coupling *g*. The tendency of this spring to force *h* backward away from the flywheel is resisted by another spring *o* acting against the ball bearing *l*,



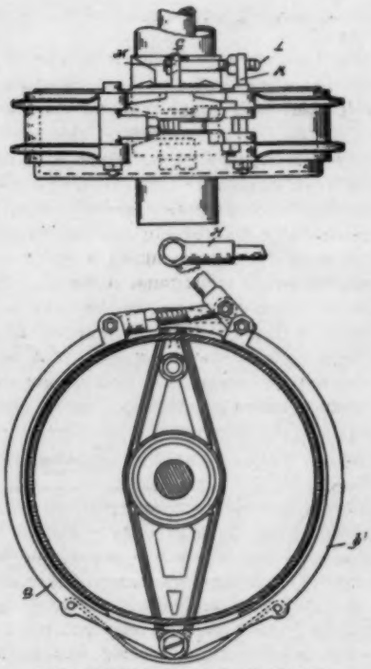
GIRARDOT FLYWHEEL CLUTCH.

as the drawing shows. The round-headed bolt *p* through which the spring acts, permits *h* to reflect.

Friction Transmission.

No. 786,916.—E. F. McKaig, of Chicago, Illinois.

In this invention the friction wheel *11* is driven by a longitudinal shaft from the motor, and it transmits motion in opposite directions to the disks *19 20*, of which the former acts through a pair of spur gears on the sprocket pinion *42*, in order to get motion in the right direction. The friction disks are normally pressed against the wheel by the action of spring *31*, on the levers *28* and *29*. They are released by the action of the bell crank *36* and pedal *38*. The



HARRINGTON REAR HUB BRAKE.

other pedal *52*, when pressed, tightens the outside rollers *48 48*, against the disks to support the latter against the driving pressure. The inventor proposes to use no differential, but instead to release one or the other friction disk by connection with the steering gear when turning curves. The mechanism for this purpose is indicated by the parts *60*, *62* and *63*, of which the last is provided with stops *66*, acting on lever *28* or *29* as the case may be.

Rear Hub Brake.

No. 786,807.—N. T. Harrington, of Detroit, Michigan.

This is an external brake of the general character shown, in which the two brake shoes *a b* are pivoted at their lower ends and tightened by tension on the rod *H*. This rod is carried back by a spring (not shown), to release the brake, and special provision is made to ensure that both of the brake shoes shall positively free themselves from the drum. This device takes the form of a bolt *K*, through one of the shoes having attached to it the bolt *L*, whose head *c* comes to a stop in the fixed lug *M* when *b* is free.

FOREIGN NEWS NOTES

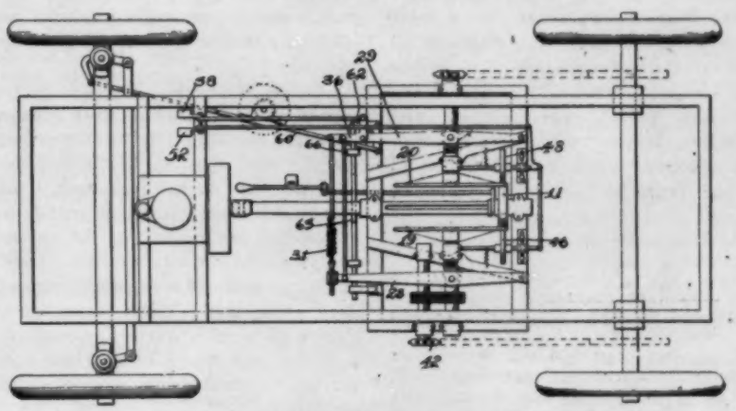
The German Automobile Club and the automobile manufacturers of Germany are planning to hold an automobile and bicycle exposition in Frankfort, October 6 to 15, 1905.

The British eliminating trials for the Gordon Bennett Cup have been set back to May 30, the date originally fixed provisionally by the Races Committee. The Isle of Man authorities approve of the change.

Mr. Siddeley has accepted M. Paul Meyan's challenge for an English touring car to run against his de Dietrich over a distance of 5,000 kilometers, in daily tours of about 350 to 400 kilometers. Mr. Siddeley adds the condition that half the distance be covered in England and half in France. A commission will be appointed to settle the more definite rules for this Anglo-French test.

Messrs. Alexander Burton Braun and Werner will drive the Austrian Mercedes cars in the Gordon Bennett event. Mr. Burton had arranged to steer a Mors, but on the withdrawal of this make he turned his attention to the Mercedes cars. Werner and Braun are both well-known drivers. Werner has several times driven for Clarence Gray Dinsmore, notably in the Vanderbilt Cup race. Mr. Dinsmore will take part in the Herkomer Week in August in Bavaria, as will also Baron de Caters.

When an automobile runs over a man the automobile is never running too fast. Of course not. The man is running too slow.—*The Chauffeur.*



McKAIG FRICTION TRANSMISSION MOUNTED ON RUNNING GEAR.

THE AUTOMOBILE

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Speed Law Violations.

New York has had a stir within the week over a city magistrate's public utterance against the "inadequacy" of the law prescribing penalties for the reckless speeding of automobiles. "I would like to make a law that would send every one of you desperate men to jail for thirty days," is his utterance, as quoted in the daily press. As a voice from the judiciary, the speech calls for a serious canvass of the whole situation.

It has been the contention of this paper that so far as the letter of the law is concerned, the present law is entirely adequate. It must be kept in mind, always, that this law prohibiting speeding in the public highway was framed with regard to a mere speeding of a machine, regardless of all possible resultant consequences. In the longest, clearest stretch of roadway in the state of New York a man may not speed his machine beyond the statutory limit without becoming liable to arrest, and to suffer the penalties prescribed for first, second and third offenses. And these penalties in their order are, quoting from the statutes:

* * * "shall be deemed a misdemeanor and punishable by a fine not exceeding $100 for the first offense; and upnishable by a fine of not less than $50 nor more than $100, or imprisonment not exceeding thirty days, or both, for a second offense; and punishable by a fine of not less than $100 nor more than $250, and imprisonment not exceeding thirty days for a third or subsequent offense."

When a man may suffer $100 fine for a first offense in speeding in the acknowledged safest place in a public highway anywhere in the state, it is too much to ask even a biased public judgment to agree with our New York magistrate that this punishment prescribed is inadequate, especially when it is remembered that for any personal injuries or property damages resulting from the offense, the whole wide range of the civil and criminal courts is open to the victim. It is possible to commit deliberate murder, using an automobile as the instrument. It is easy to commit manslaughter. And in any circumstance where an unlawful rate of speed enters into the circumstance, the civil courts invite the victim to legal processes for damages.

All of which seems to be beside the mark, however, when considered as it should be by the best interests of the automobile industry. To the builder, owner, driver and all the associated individuals involved, the grim fact remains that the man who violates the law is offending as deeply against the best interests of the automobile as he could offend against the statutes. That a motorist for any cause has been arrested within the possible zone of an owner's pleasure routes cannot but remind the law-abiding citizen that he may be taking a risk in going out at all; it cannot fail to impress the man who has thought of buying a car, and who may be hesitating, that after all the ownership of a car is involving a tremendous amount of litigation and worry and talk and trouble, and that the least he can do is to wait until things have shaped themselves a little clearer and better.

And in all this time and under all these circumstances, the lawless operator of a machine goes on his way as the police and the courts may allow, a pariah among decent operators, and the worst menace that the trade is facing.

The time has come when the best interests of the automobile business must assert themselves. Unjust laws have been passed against the motorist, but where the decent motorist has fought them by injunctions, for instance, and in this manner has set them aside, he has been co-operating with the pariah who has no regard at heart for any speed law that is short of the powers of his machine.

Chicago newspapers have had occasion to remark in the last winter that anywhere in the city it has been difficult to find sympathy for the victim of an automobile accident who may have been a passenger in the machine. The door that opens quickly for the individual victim in the street, swings grudgingly to the one who may have been in the tonneau. Autophobia is rampant in many places and in many forms, but this is an ugly shape of it, scarcely understood until it is recalled that Chicago has been the hot bed of insurrection against automobile regulations.

Are these not the handwritings on the wall? Sooner or later an educated public sentiment must give the automobile owner the fullest privileges that are to be accorded him with reference to the rest of the world. The chief question now seems to be, How quickly may we reach the advantages of that educated public sentiment? Manifestly through automobile interests co-operating everywhere in removing every questionable cause for prejudice. And it will not be questioned that one cause, removed by the influences of the automobile world itself, will read more assurance and fairness to the public than half a dozen causes removed under protest by the strong hand of the law.

The autoist and manufacturer alike are facing a condition, not a theory. As we see it, even the self interests of the motorist and manufacturer alike should prompt united action in making scorching impossible as a first unquestioned move. When he is extinct under the twenty-mile statute, the public which by millions never hopes even to ride in an automobile, may be prepared to accede that a thirty or forty-mile statute is reasonable in country roads.

But to-day the automobile interests of this country should make a move and a decided one. Much of the solution of the matter is in their own hands.

The Knocking Nuisance.

"Knocking" is an accepted term descriptive of one of the lingering impulses that began with pre-historic man. The first "knocker" was the first man who, disliking his fellow-man, seized a club and knocked his head off. Evolution has dispensed with the literal club. Finally it had to prohibit certain forms of speech as slanderous and punishable. And at last, in the minds of the most liberal of thinkers, any kind of "knocker," engaged in any form of "knocking," has become open to suspicions of narrowness and littleness not at all in keeping with the age.

Andrew A. Russell, writing to us from Cleveland, voices in this issue the lack of business prudence shown by the knockers in the field of automobile manufacture. We can add to his specific instance of its evils by reciting the recent experience of a man who had decided to pay $5,000 to $7,000 for a foreign machine. But in the first salesrooms he discovered that every other foreign car was condemned past all hope of absolution, and in the salesrooms of all the other agencies, all the other cars in turn were impossible. The result is that the man who wanted a foreign machine is driving an American car.

In those days when the old-time circus, with its following of pickpockets, mountebanks and plug uglies, became a veritable visitation of providence upon a community, every circus was the "largest on earth." Weeks before its coming a community was posted with "wait-for-it" bills against all other aggregations which by implication were "one horse shows" not to be considered in the

same breath. And these were the days when the circus was at its worst and when the old cry of "Hey, Rube!" was only a little less alarming than the thundering of an enemy's guns against a city's walls.

It might be questioned if some of the best businesses of the country would accept, free, any publicity that would drag into it the element of "knocking." It may be remarked that Tiffany's in New York takes unto itself none of the virtues of invidious comparisons. Marshall Field's in Chicago probably is the largest store of the kind in the world, yet his paid advertising seems to avoid mentioning the fact. But in some of the small communities where mercantile life still is in embryo, this commercial "knocking" is the meat upon which the village Cæsar hopes to grow so great.

By analogy, at least, the "knocking" which exists among the automobile builders is doing no more than to lay false emphasis upon the idea that the automobile is in a merely transition state. Would the sane builder concede that such a condition could be good for business? Our Cleveland correspondent has used a legitimate hammer in hitting a nail squarely upon the head.

✷

A Point on Air Cooling.

A point which seems to have escaped the attention of some of the experimenters in air-cooling by convection is that even the most rigorous application of this principle does not require that every particle of the air employed should be brought into molecular contact with the cylinder walls before its discharge. On the contrary, by far the larger portion of the air forced past the cylinder or through the ribs, spines, or flutes, plays an amply useful part merely in diluting the air heated by contact with the surfaces. If any given molecule comes in contact with the heated surface for the barest instant, it is sufficiently heated thereby to be thenceforth useless for cooling until it has given up the greater part of its heat by mingling with cooler air.

The simplest way to approach the problem is to calculate the quantity of air required to absorb the given number of thermal units, and to blow this air over the cylinders in such a way as to insure that what does not touch the cylinders will become thoroughly commingled with that which does. In addition, sufficient surface for convection must be provided, as determined by calculation and experiment. With the proper combination of these two elements it should be unnecessary to go out of one's way to compel every particle of the air to touch the hot surfaces.

The latest advices from Charles J. Glidden indicate that he arrived at Sydney, N. S. W., Australia, on March 24, 1905, in his Napier car. His total mileage in his tour around the world to that date was 23,547, after having been on the road for 198 days. Java and Malay were the next places on his itinerary.

DETROIT LICENSE LAW HELD VALID.

State Supreme Court Affirms Decision of City Court Convicting J. P. Schneider — Holds Ordinance Is "Justifiable Exercise of Police Power" and Fee Is Not Source of Revenue.

Special Correspondence.

DETROIT, April 24.—The test case of John P. Schneider, the Detroit automobile dealer, against the city ordinance requiring the registration and numbering of automobiles, has been lost by the decision of the Supreme Court of Michigan.

The opinion of the court affirms the conviction of Mr. Schneider by the recorder's court of Detroit, for operating an auto without securing a license and without placing upon it a number, as required by law. The opinion of the Supreme Court was signed by Justices Carpenter, Blair, Montgomery, Ostrander and McAlvay. They termed the local judicial decision "a justifiable exercise of the police power in the interests of the safety of the traveling public."

It will be remembered that Mr. Schneider drove up and down the main avenue of Detroit and requested a policeman to arrest him for violating the ordinance, with the object of instituting a test suit. His defence before the Supreme Court was that the ordinance conflicts with the personal liberty of a citizen and that the legislature has never granted the city of Detroit power to pass such an ordinance.

The Supreme Court holds that the city has a right to make such an ordinance under the city charter which gives the council authority to control and prescribe the manner in which the highways are to be used. The decision is one of the first ever rendered by the Michigan Supreme Court in an automobile case. In part the opinion says: "We may take judicial notice that many automobiles may be driven at a speed of at least forty miles an hour. Driven by indifferent, careless or incompetent operators, these vehicles may be a menace to the safety of the traveling public. Under its authority to regulate the use of the streets the city may enact ordinances which will diminish this danger. It is not difficult to see that the registration and numbering of automobiles is intimately connected with their safe operation in the streets. In a city like Detroit many automobiles are precisely alike in external appearance. They are sometimes operated by persons whose faces are partially concealed and whose identity is uncertain. Those operators who are most reckless and indifferent, and those are the ones who endanger the safety or others, may violate this ordinance with impunity unless some method is adopted by which their automobiles may be identified."

Answering the claim that the city council has no power to require payment for a license, the court rules that the sum is no more than is necessary to pay for the cost of issuing a license number, and is in no way a source of revenue. It further rules that the ordinance does not come within the constitutional provision prohibiting "unreasonable searches" or compel any man to be a witness against himself.

GARAGE KEEPERS' LIEN BILL KILLED.

Special Correspondence.

ALBANY, April 25.—Assemblyman Stanley's garage keepers' lien bill was defeated in the assembly to-day very decidedly. The vote was 69 to 29, when it requires 76 votes to pass it. The chief objection to the bill by the lawyers who killed it was that it permitted the re-establishment of the lien after the owner had taken the machine or property out, without having paid the bill for storage, fuel and repairs. Messrs. Palmer, Fish and Beihilf, of Schoharie, Madison and New York counties, respectively, were the lawyers who had the most to say about upsetting the settled policy and method of the law by letting a lien rest and be re-established whenever the property of the delinquent automobile owner should come back into the possession of the garage keeper, who still holds the bill.

Mr. Stanley, after the defeat of the bill, made the usual motion to reconsider the vote by which the bill was lost, and that the motion lie on the table. This was adopted, and he can call up the bill any time when he thinks there are votes enough to pass it.

LICENSES REQUIRED IN MAINE.

Legislature Passes New Law to Supplement Speed Measure of 1903.

Special Correspondence.

PORTLAND, ME., April 24.—The state of Maine has stepped into line with the other states and now has a license law. The old law of 1903 limits the speed throughout the state to fifteen miles an hour, and within the built-up portions of cities, towns and villages, to eight miles. The main provisions of the new law are as follows:

Every owner of an automobile must have it registered with the secretary of state. The price of such registration is $2. In return for the payment of the fee, he will receive two large enameled signs bearing figures not less than four inches in height. One of these is to be placed at the front of the automobile and the other at the rear. Letters denoting the state, not less than one inch in height, are also furnished. A motor-cycle must have one sign displayed in the rear.

Every operator of an automobile must also have a license which will cost him $2.

Agents and dealers in automobiles must take out licenses costing $10.

Non-residents who have registered in other states are exempt provided their cars carry license tags bearing the initials of their states and the numbers of their licenses.

All licenses must be taken out on or before May 1.

The last legislature, besides passing the foregoing bill, enacted another that specifically prohibits the use of automobiles in the town of Castine except on one thoroughfare.

NEW YORK STATE REGISTRATION.

Special Correspondence.

ALBANY, April 24.—Owners of automobiles or motor vehicles are registering their machines at the rate of from thirty to fifty a day much of the time, while chauffeurs are applying for licenses at about half that number per day.

Up to April 22 there had been registered by the Secretary of State and certificates and tags issued for motor vehicles 17,056; on April 21 the total number of registered cars was 17,006. The number of chauffeurs registered up to April 22, according to the records in the office of the Secretary of State, was 5,260.

The largest number of cars or motor vehicles registered by any one concern is 491 by the New York Transportation Company of New York City, which called for 475 vehicle tags and certificates at one time and has asked for sixteen more since.

NEW DELAWARE LAW IN EFFECT.

Text of Measure Passed by the Last Legislature and Signed by the Governor —Motorcycles Apparently Exempt— Speed Limit in Country Twenty Miles.

Special Correspondence.

WILMINGTON, April 24.—The governor recently signed the new automobile bill passed at the last session of the Delaware legislature, and it is now in effect. In defining the term "motor vehicle" and exempting from the provisions of the law any "bicycle or other vehicle propelled wholly or in part by muscular power by means of pedals," it is evident that the law does not apply to motorcycles. From the wording of Section 13 it also seems as if it might be possible to prosecute chauffeurs who take out and use their employers' cars without the owners' knowledge and consent, although it is presumably aimed to deter persons from entering and driving about in cars left standing unattended by the side of the street or road in front of offices and residences.

Following is the text of the law in full:

An act defining motor vehicles and providing for the registration of the same and uniform rules regulating the use and speed thereof.

Be it enacted by the Senate and House of Representatives of the State of Delaware, in General Assembly met:

Section 1. Wherever the term "motor vehicle" is used in this act it shall be construed to include automobiles, locomobiles and all other vehicles propelled wholly otherwise than by muscular power, excepting cars of electric and steam railways and other motor vehicles running upon rails or tracks; but nothing in this act contained shall be construed to apply to or affect bicycles, tricycles or such other vehicles as are propelled exclusively, or in part, by muscular pedal power.

Section 2. Every resident of this State who is the owner of a motor vehicle shall file in the office of the Secretary of State a declaration duly verified that such owner is competent to drive the motor vehicle for which application for license is made, and a written statement containing the name and address of such owner, together with a brief description of the character of such motor vehicle, including the name of the maker and the manufacturer's number of the motor vehicle, if number there be, and the rated horsepower of the motor vehicle, and shall pay to the Secretary of State a registration fee of two dollars for each motor vehicle; the Secretary of State shall issue for each motor vehicle so registered a certificate, properly numbered, stating that such motor vehicle, is registered in accordance with this section, and shall cause the name of such owner, with his address, the number of his certificate, and a description of such motor vehicle or motor vehicles, to be entered in an alphabetical order of the owners' names in a book to be kept for such purpose; this section shall not apply to manufacturers or dealers in this State of motor vehicles except as to vehicles kept by such manufacturer or such dealer for private use or for hire.

Any non-resident of this State who is the owner of a motor vehicle may remain in this State for a period of forty-eight hours without being required to register his vehicle in accordance with the provisions of this Act.

Any non-resident of this State who is the owner of a motor vehicle who shall remain in this State for a longer period than forty-eight hours shall be subject to all the provisions of this Act.

Section 3. The owner of each and every motor vehicle driving the same upon the public streets, public roads, turnpikes, parks, public parkways, public driveways or other public highways in this State shall have the number of the license issued as aforesaid by the Secretary of State upon the back of every such motor vehicle, in a conspicuous place so as to be plainly visible at all times during daylight, such numbers to be separate Arabic numerals, not less than three inches in height, the strokes to be of a width not less than three-eighths of an inch, and such owner shall not be required to place any other marks of identity upon said motor vehicle.

Section 4. Every motor vehicle shall carry, during the period from one hour after sunset to one hour before sunrise, at least two lighted lamps, showing white lights, visible at least two hundred feet in the direction toward which such motor vehicle is proceeding, and shall also exhibit one red light visible in the reverse direction. Said red light shall be so hung upon the motor vehicle that it may illuminate and make visible the register number of said vehicle. Every motor vehicle shall also be provided with a good and efficient brake or brakes, and shall also be provided with suitable bell, horn or other signal device.

Section 5. The following rates of speed may be maintained, but shall not be exceeded upon any public street, public road or turnpike, public park or parkway, or public driveway or public highway in this State by any one driving a motor vehicle:

a.—A speed of one mile in six minutes upon the sharp curves of a street or highway and at the intersection of prominent cross-roads where such street, road or highway passes through the open country, meaning thereby portions of a town, township, borough or village where houses are more than one hundred feet apart.

b.—A speed of one mile in seven minutes where such street or highway passes through the built up portion of a city, town, borough or village where the houses are an average less one hundred feet apart.

c.—Elsewhere and except as otherwise provided in subdivisions "a" and "b" of this Section a speed of one mile in three minutes; provided, however, that nothing in this section contained shall permit any person to drive a motor vehicle at any speed greater than is reasonable, having regard to the traffic and use of highways, or so as to endanger the life or limb or to injure the property of any person; and it is further provided that nothing in this section contained shall affect the right of any person injured either in his person or property by the negligent operation of a motor vehicle to sue and recover damages as heretofore.

Section 6. Every person driving a motor vehicle shall, at request or upon signal by putting up his hand or otherwise from a person riding or driving a horse or horses in the opposite direction, cause the motor vehicle to stop and remain stationary so long as may be necessary to allow said horse or horses to pass on.

Section 7. No owner of a motor vehicle who shall have obtained a certificate from the Secretary of State as hereinbefore provided, shall be required to obtain any other license or permit to use or operate the same, nor shall such owner be excluded or prohibited from or limited in the free use thereof, nor limited as to speed upon any public street, avenue, road, turnpike, driveway, parkway, or other public place, at any time when the same is or may hereafter be opened to the use of persons having or using other pleasure carriages, nor be required to comply with other provisions or conditions as to the use of said motor vehicle.

Section 8. Any person driving a motor vehicle the owner of which shall not have complied with any of the provisions of this act, or which motor vehicle shall display a fictitious number, the same being a number other than that designated for such motor vehicle by the Secretary of State shall, upon conviction, be fined in a sum not exceeding one hundred dollars, and, in default of payment thereof, be punished by imprisonment in the county jail for a period not exceeding thirty days, provided, this section shall not be construed to prohibit a motor vehicle displaying the proper number of its license from also displaying any other number for any lawful purpose.

Section 9. Any person driving a motor vehicle upon any public streets, public highways, public roads, turnpikes, parks, public parkways or public driveways in this State in a race or on a bet or wager shall, upon conviction, be fined in a sum not exceeding fifty dollars, and, in default of payment thereof, be punished by imprisonment in the county jail for a period not exceeding twenty days.

Section 10. The Justice of the Peace of this State shall have jurisdiction of all offences against the provisions of this Act, and upon oath or affirmation made that any person has violated any of the provisions of this Act, any Justice of the Peace of the State of Delaware may issue a warrant for the arrest of the person so charged. Said warrant shall state what section or provision of this Act is alleged to have been violated by the defendant or defendants and the time and place of said violation, and immediately upon the arrest of such person, at any time to which the trial may be adjourned, the Justice of the Peace before whom said complaint shall be made, shall proceed with the trial of the case, and shall hear the testimony, and determine and give judgment in the matter, and if upon such trial the Justice of the Peace shall find the person arrested to be guilty, he shall give judgment for such penalty as is provided for in this Act, and for such costs as are now allowed by law in the prosecution of cases before Justices of the Peace in this State, and, in default of the payment of the judgment and the costs, the defendant so convicted may be sentenced to imprisonment for such period as is provided for in the provisions of this Act. The Justice of the Peace before whom a complaint is made shall adjourn the hearing of said case for a time not exceeding ten days, if the defendant shall so request, and shall deposit the sum of one hundred dollars with the Justice of the Peace as security to appear at the time and place to which said hearing may be adjourned, and if the said defendant fails to so appear, then the said sum of one hundred dollars, so deposited, shall be forfeited to the county wherein the alleged offence is committed.

Section 11. Any constable or police officer is hereby authorized to arrest without warrant any person driving a motor vehicle contrary to the Fifth Section of this Act, and bring the person so offending before any Justice of the Peace of the State of Delaware. The person so offending shall be detained in the office of such Justice of the Peace until the officer or constable making such arrest shall make oath or affirmation

which he shall do forthwith, as provided in Section 10 of this Act, whereupon said Justice of the Peace shall issue a warrant returnable forthwith in accordance with the provisions of Section 10 of this Act. Any defendant convicted under any of the provisions of this Act, may appeal from the judgment or sentence of the Justice of the Peace, to the Court of General Sessions of the State of Delaware, in and for the county in which the said offence is alleged to have been committed, within three days from the date of said sentence.

Any defendant appealing shall enter into recognizance with sufficient surety in such sum as may be satisfactory to the Justice, conditioned for the appearance of said defendant at the next Court of General Sessions for the county where the offence is alleged to have been committed.

Upon appeal the said Court of General Sessions shall have the same jurisdiction to hear and determine the appeal as it now has by law for the trial of misdemeanors, and the proceedings shall be by indictment by Grand Jury and trial by Petit Jury.

Section 12. Any person violating any of the provisions of this Act, for which violation no specific penalty is provided, shall, upon conviction, be fined in a sum not exceeding one hundred dollars, and, in default of payment thereof, may be punished by imprisonment in the county jail or workhouse for a period not exceeding thirty days.

Section 13. Any person using, interfering or tampering with any motor vehicle without the permission of the owner or the person in charge of said motor vehicle, shall upon conviction be fined in a sum not exceeding one hundred dollars and, in default of payment thereof, may be imprisoned for a period not exceeding thirty days.

Section 14. That traction engines used for agricultural purposes shall be exempted from the provisions of this Act.

Section 15. All Acts or parts of Acts inconsistent herewith are hereby repealed.

Passed at Dover, Delaware,
March 2, A. D. 1905.
WM. D. DENNEY,
Speaker of the House of Representatives.
ISAAC T. PARKER,
President of the Senate.
Approved this the sixth day of April, A. D. 1905,
PRESTON LEA,
Governor.

NEW JERSEY TOLL CHARGES.

Special Correspondence.

TRENTON, April 25.—The Hunt bill to regulate the charge for the passage of automobiles or other motor vehicles over the turnpikes of New Jersey, which was recently passed by the legislature and signed by the governor, became effective at once. The provisions of the bill are as follows:

Any turnpike company of the State, whether incorporated under general or special law, is authorized at all times to take, demand and receive from any person or persons traveling over any turnpike of such company in an automobile or other motor vehicle a toll of not more than one cent for each automobile built to carry two persons, and two cents for each automobile or motor vehicle built to carry more than two persons, for each mile traveled, and all fractions over half a mile, on said turnpike. The toll gatherers are empowered to prevent any person or persons from riding in or driving such automobile or other motor vehicle through the gates or over said turnpikes until the toll as specified shall have been paid.

This law applies only to the toll roads, and there are few of these in New Jersey.

ILLINOIS BILL IN DANGER.

Chicago Club Measure Likely to be Killed on Third Reading.

Special Correspondence.

CHICAGO, April 24.—There are breakers ahead for the automobile bill pending in the Illinois legislature, which is supported by the Chicago club. The chances are that it will be killed in the house this week. While it was advanced to the third reading last week, the method employed in its advancement will almost certainly defeat the measure.

When the bill was called up for second reading last Wednesday certain country members were ready with amendments. There was a motion to call the roll, and on this the clerk did not call the roll, but asked for a rising vote. This vote he declared in the affirmative, while it was evident that the result was against the call. So the bill went to the third reading, where it will have to be passed or defeated, no amendments being allowed at that stage, and the country members are wroth.

Secretary Gorham has not given up the fight, but those who are on the inside declare that the measure is practically dead. There is also a strong effort being made by friends of another of the bills offered by the country members, that provides that no machine shall be geared to run more than twenty miles an hour. The impracticability of such a measure cannot be explained to the lawmakers. They say that the automobilists only ask for a twenty-mile limit, and then ask why should the gear be higher.

REWARD FOR DRIVER'S ARREST.

Special Correspondence.

BOSTON, April 24.—The Bay State Automobile Association has decided to take an active part in the discouragement of reckless automobile driving, and has followed the example set by the A. C. A. in offering a reward of $50 for the arrest and conviction of the automobilist who on Thursday evening, April 13, ran into and fatally injured James P. Flynn, of Dorchester. The accident occurred at the corner of Washington street and Massachusetts avenue, Boston, and witnesses state that the man was handling his machine in a reckless manner. After he had knocked down Mr. Flynn he put on speed and escaped. One of the witnesses caught the number of the machine, and upon investigation it developed that it was the number of a dealer in Fairhaven. This man was questioned and proved that none of his machines were in Boston. He stated that he had lost one of his numbers, and probably the man who ran down Mr. Flynn found it and has been operating under false colors. The police are working hard to locate the driver, and it is expected that the reward offered by the Bay State association will prove an extra incentive for them and for others.

TAX BILL FURTHER AMENDED.

Special Correspondence.

ALBANY, April 24.—Senator L'Hommedieu's motor vehicle tax bill has been reprinted with the amendments of April 19 incorporated and is found to be practically a redrafting of the bill to make it conform to the state motor vehicle registration and regulation act of last year.

As amended, the bill provides for sections and sub-divisions which it did not have before. The essential feature of the change, however, as revealed by the reprinted bill, is the demand for the registration of the horsepower of each motor vehicle in the future, and the provision for a supplemental statement from owners of already registered motor vehicles which shall mention the horsepower of the vehicle.

There is no change in the phraseology of the bill which provides for double taxation and the highly inequitable and unjust feature of compelling every automobile or motor vehicle manufacturer to pay a tax on each automobile he has in stock, and also compelling the purchaser of said vehicle to pay another tax when he registers it under his name. The bill still reads:

"An annual tax of one dollar per horsepower is hereby imposed upon every motor vehicle owned by a resident of this state."

This does not exclude the manufacturer, but, as was pointed out by Attorney Charles T. Terry, for the Manufacturers' Association, when he was last before the Senate committee on taxation, it compels him to pay $1 per horsepower on every motor vehicle which he may make and have in stock. The other sections of the bill compel the purchaser and subsequent owner to pay this same tax over again on the same machine before he can secure its registration by the Secretary of State.

AN AUTOMOBILE POCKETBOOK.

A work that will doubtless be welcomed by automobilists, and particularly by inexperienced owners or prospective owners of cars who desire a clear explanation of the construction and operation of the present-day gasoline automobile, is "The Automobile Pocketbook," by E. W. Roberts, M.E., published by the Gas Engine Publishing Co., of Cincinnati, O. In this book two points are specially noticeable. One is that the author has wisely refrained from all reference to freak methods of construction, thus relieving the novice of the perplexing task of remembering and mentally separating the practical and the impracticable, and setting before him good examples of sound engineering. The second point is that there is but little space devoted to mathematical formulas, abstruse or otherwise, the references made to this side of the subject covering a few points that are likely to be really useful to the every-day automobilist. However valuable a mass of mathematical information may be to the expert and the designer, it is simply skipped by the beginner. Another commendable feature is that the history of automobile building has not been drawn upon for examples of how automobiles are never built nowadays; the past is allowed to remain in obscurity, where it belongs, so far as such a work as the one in question is concerned. In addition to descriptions of the various parts of an automobile and their functions, many pages are devoted to practical information concerning the running of the car, making adjustments and simple repairs, and many little matters that the automobilist must find out, sooner or later, by experience, if he has no quicker method. Direct, simple language is used to convey information clearly, puzzling technicalities and digressions being avoided. A good index brings the number of pages in the book up to 329. The volume is of the popular pocket size and is bound in black leather.

VEHICLE TAX FOR BUFFALO.

Special Correspondence.

BUFFALO, April 24.—The ordinance committee of the Board of Aldermen has voted to report in favor of a vehicle tax in this city. A resolution was passed requesting Corporation Counsel Feldman to draft such an ordinance, and to include in the schedule of rates for different vehicles the following: Automobiles, express or delivery, $5; motorcycles, $2; automobiles, two persons or more, $5.

BAY STATE RACE MEET.

List of Events for Memorial Day at Readville—Banquet to Ross.

Special Correspondence.

BOSTON, April 24.—The racing committee of the Bay State Automobile Association held several meetings during last week, arranging its plans for the Memorial Day race meet which will be held at the Readville track. The list of events has practically been decided upon, and is so varied as to include machines of the several classes from the high-powered racing cars down to the small runabout.

The schedule of events as now arranged, which, however, is subject to change, is as follows:

Ten-mile, open, for the Boston *Herald* $500 trophy, now held by Herbert L. Bowden. Second and third prizes in this event will be offered by the Association.

Five miles, for two-cylinder gasoline stock cars, full touring equipment, mufflers attached; first prize $500 Moxie cup; second prize, $50 cup.

Five miles, for steam stock cars, full touring equipment; first prize, $200 cup; second prize, $50 cup.

Five-mile club championship, for members of organized clubs; first prize, $250; second prize, $100 (cash or plate).

Five-mile time trials, open.

One-mile time trials, open.

Five miles, for four-cylinder cars not exceeding thirty horsepower, full touring equipment, muffler attached; first prize, $250; second prize, $100 (cash or plate).

Five-mile open; first prize $250; second $100 (cash or plate).

In arranging its program the committee very wisely provided more than one event for the higher powered machines, which will likely prove of great assistance in securing the entry of such cars. Many owners have already signified their intention to have their cars appear at the meet.

Secretary Amos G. Batchelder, of the A. A. A., will be requested to act as referee, and the other officials will be selected from New England's most prominent automobilists.

The entertainment committee of the Bay State Association has arranged to tender a complimentary dinner to Louis S. Ross on Saturday evening, April 29, at which time the Sir Thomas Dewar Trophy, which was won by Mr. Ross at Ormond in January, will be presented to him by a personal representative of Sir Thomas. Mr. Ross will in turn deliver it to the Association for safe keeping. President Hyde, of the New York Motor Club, and W. J. Morgan, also of New York, will be in attendance at this dinner.

BOAT CRUISE TO THOUSAND ISLES.

Special Correspondence.

SYRACUSE, N. Y., April 24.—Definite arrangements have been made for the motor boat cruise to the Thousand Islands, which will be held this summer under the auspices of the American Power Boat Association. J. H. McIntosh, R. C. Fisher and J. Norris Oliphant, the cruise committee, have arranged a most convenient schedule. The boats are to meet at Hudson, N. Y., August 17, at noon, and, leaving at 3 p. m., will enter the Erie canal at Watervliet, cruise through to Oswego, thence directly through Lake Ontario and the St. Lawrence to the Islands.

A special permit will have to be obtained for the boats to enter the Erie Canal, and for this reason the entries will close August 12, as it will be necessary to state the number of boats intending to enter. Boats passing through will be limited to 98 feet or under in length, and with a maximum width of 17 feet, draught 6 feet, and whose height under bridges is not more than 12 feet above the water line.

The cruise will end at the quarters of the Thousand Island Yacht Club, at Alexandria Bay, where the members of the fleet will be the guests of the club during the three days of the challenge cup races—August 24, 25 and 26. Each evening there will be a boat carnival on the bay, with illuminations and fireworks. On the final race day, the committee will declare the cruise at an end.

The challenge cup races will be held under the auspices of the Chippewa Yacht Club, the present home of the *Vingt-et-Un II*, owned by E. S. Kilmer, who holds the trophy.

ORPHANS' DAY IN FAR WEST.

Little Dependents of Salt Lake City Given Outing by Local Club.

Special Correspondence.

SALT LAKE CITY, April 18.—On Saturday last the Automobile club of this city gave the little orphans of Kearns-St. Ann's and the State street institutions the gala day of their lives, when for the first time they were all treated to an automobile tour about the city.

At the appointed hour eighteen automobiles, big and little, lined up on State street, near Twelfth South, and went first to the State street orphanage, where the little ones were taken aboard, and then to Kearns-St. Ann's. There were not sufficient cars to accommodate all at one time, so a second tour had to be made in order that not one should be deprived of the day's outing.

The cars made a trip around the park, through the main drives, over the principal streets of the city, and to the depot, each one filled with a wide-eyed, wide-mouthed, shouting lot of youngsters. Adding much to the pleasure of the little folk was a visit paid to the candy establishment of the Sweet Candy Company, where Mr. Sweet furnished them box after box of dainty sweets, and later to Hewlett's, where soda water was freely dispensed.

It is needless to say that the children enjoyed every minute of the afternoon, and the Salt Lake Automobile Club will long be remembered by each of them. And, too, the drivers of the several machines shared equally with the children in the pleasure of Salt Lake City's first orphan automobile day.

ABUNDANT RACING PROMISED.

That there will be no scarcity in the number of automobile race meets on the tracks of the metropolitan district during the summer, is evidenced in the announcement that the secretaries of the Morris Park, Brighton Beach and Empire City tracks, have applied for reservation of dates covering twenty-five separate events between May 6 and October 28. A meeting of representatives of these tracks was held a few days ago, and an arrangement was effected whereby the dates were apportioned so as to avoid conflict, and sanctions were requested for the three tracks as follows: Brighton Beach eight meetings, the opening event to be held on May 6; Morris Park nine meets, opening with May 20, and Empire City track eight meets, opening on Decoration Day. Under the arrangement each track will be given a holiday meet, Empire City securing May 30; Morris Park, July 4, and Brighton Beach, Labor Day.

Sanctions will not be granted for these meetings until after May 1.

A. A. A. RACE MEET.

National Two-Day Event to Be Held at Morris Park July 3-4.

The first national championship automobile track meet to be held under the auspices of the American Automobile Association is announced for July 3 and 4, at the Morris Park track, New York. At the recent meeting of the board of directors of the A.A.A. a special committee was named, composed of Robert Lee Morrell, chairman of the racing board; George E. Farrington and A. G. Batchelder, the newly appointed secretary, who will succeed C. H. Gillette on May 1, to treat with the Morris Park Motor Racing Club and make the necessary arrangements for the course. These were perfected this week, and the meet is now assured.

It is the purpose of the committee to make this event the most notable race meet in the history of automobiling, and in its program will include many novel features for both professional and amateur drivers. Races will be provided for all classes of machines, and several of the contests will carry championship title.

The directors of the Association decided to conduct such an event for the reason that it offered probably the best means for realizing the necessary funds with which to defray the expenses incidental to carrying out the extensive work planned for the season.

The list of the several events and full particulars will be announced at a later date.

TRANSCONTINENTAL CONTEST.

Novel Private Competition Announced by the Olds Motor Works.

Special Correspondence.

DETROIT, April 24.—The Olds Motor Works has just announced a project to send two Oldsmobile standard stock runabouts across the continent to the Lewis and Clark Exposition at Portland, Oregon. The start will be made from New York City, on May 8, and the run is timed to reach Portland for the opening of the Good Roads convention there. The trip is being made in the interests of good roads.

The Olds works will invite volunteer drivers for the trip and will receive applications either by wire or by letter in this city. Two men will be selected from those who volunteer, and an expert mechanician will accompany each runabout. The Olds people will pay all the expenses, and the driver bringing his machine first into Portland will receive a cash prize of $1,000. The other man upon his arrival will be given the machine he drives.

The standard Olds runabout was the first light car to cross the American continent, and the manufacturers feel that it is unquestionably well adapted for this project in the interests of good roads.

LATEST VANDERBILT CUP ENTRIES.

Two new American entries for the Vanderbilt cup race have been announced within the week, making nine to date. E. H. R. Green, of Dallas, Tex., has entered through the Dallas Automobile Club his 60-horsepower Franklin racer now building for him in Syracuse, description of which is not yet available, though the engine is said to have eight cylinders. Dr. Harold E. Thomas has formally entered his Locomobile Gordon Bennett car, which was described in the April 22 issue of THE AUTOMOBILE. The other two American entries are Pope-Toledo cars.

CLUB PARADE SATURDAY.

Will Eclipse Former Events—Neighboring Clubs Will Participate.

Favored with good weather, the automobile parade which will take place in New York City on Saturday, April 29, under the auspices of the Automobile Club of America, should prove to be the greatest procession of the kind ever witnessed in this or any other American city. From present indications the number of automobilists who will take part in this parade will not fall short of the expectations of the committee in charge of arrangements.

The following neighboring clubs have accepted the invitation of the A.C.A. to participate, and will parade in a body in the division of clubs under the command of Marshal A. R. Pardington: Long Island Automobile, New York Motor Club, New Jersey Automobile and Motor Club, of Newark, Bronx Automobile Club and the Richmond County Automobile Club.

In the division of guests will be seen a large number of national, city and state officials, including, among others, President George Cromwell, of the Borough of Richmond; Judges John B. McKean, William H. Olmstead, Lorenzo Zeller, Alfred E. Ommen and John B. Mayo; Senators F. C. Stevens, Jotham P. Allds, Martin Saxe, Frank J. Gardner, John A. Hawkins and Charles Cooper; Willis Hoyt, secretary of the Park Board; William Dalton, Commissioner of Public Works; Edward A. Slattery, Collector of Assessments; Deputy Street Cleaning Commissioners F. M. Gibson, John J. O'Brien and Matthew F. Donahue, and, in addition, there will be a large number of aldermen and assemblymen.

A police escort will consist of officers from the motor-cycle squad, in charge of Roundsman Eugene C. Casey, who will lead and set the pace.

Buglers from the several local National Guard regiments will accompany each division.

WESTERN TOUR ASSURED.

Chicago-St. Paul Run Meets Favor—St. Paul Club Plans Entertainments.

Special Correspondence.

ST. PAUL, April 22.—Lovers of automobiling in St. Paul and Minnesota are preparing to entertain the participants of the Western endurance tour, which, it has been decided, will be run from Chicago to St. Paul, under the auspices of the Chicago A.C., early in July.

The St. Paul club will arrange a week's entertainment for the visitors. The city council will grant the use of West Seventh street for a day's racing, when purses aggregating $5,000 will be offered. A banquet is being arranged, and in addition there will be a parade, regattas at White Bear Lake and other features.

The start from Chicago will be made July 7. There will be two divisions, one for fast cars, which will be allowed four days in which to reach St. Paul, and the other for the slower machines, which will be given five days in which to make the run. From Chicago the automobilists will proceed to Rockford, thence to Freeport, Dubuque, Independence, Cresco, Austin, Owatonna, Faribault and St. Paul. St. Paul will be reached July 11, and the plan is to arrange the run so that most of the automobiles will reach Faribault at the same time, making the run into St. Paul together.

Routes have also been named from Kansas City and Omaha, Duluth and Helena, Mont., by way of Crookston and St. Cloud. Automobilists from these cities will reach St. Paul July 11, along with the Chicago automobilists, so that there will be a grand reunion in St. Paul on that date.

Fifty repair experts will be stationed along the route from Chicago to St. Paul, so that machines will be repaired, if need be, with the greatest promptness possible. The experts will be provided with all necessary parts and tools by manufacturers of machines and tires, who take this means of advertising their wares.

Officers of the St. Paul Automobile Club have received telegrams from officers of the Chicago club and the Illinois State Automobile Association promising the cooperation of their respective organizations.

MILWAUKEE A. C. MEETING.

Discuss Pending Legislation, Elect New Members and Enjoy Smoker.

Special Correspondence.

MILWAUKEE, April 24.—Thursday night at a regular meeting of the Milwaukee Automobile Club, which was held in the club rooms of the Hotel Pfister, legislation now pending of vital interest to all automobilists was thoroughly discussed. Jas T. Drought, chairman of the committee on legislation, reported that he had received assurances from Madison that prospects for the enaction into law of a reasonable measure were exceedingly bright. It is the consensus of opinion of the Milwaukee automobilists that in order to achieve certain results, a compromise must be reached. That is, they will have to submit to a license fee, and a distinguishing mark placed on their machines, and in return for this concession liberal speed regulations will be imposed.

The suggestion of adopting a club button or emblem by which club members would be able to recognize each other on the road, was again taken up, and the committee to which this matter had been referred was requested to report at the next meeting. In addition to this the club decided to publish a small pamphlet containing the state law governing automobiles, and also the names and addresses of its members. The meeting was brought to a close by the election to membership of August M. Grau and E. Stolp. After the meeting the members enjoyed a buffet luncheon and smoker.

The first 1905 club run was made last Sunday, when four Milwaukee cars started for Racine about 10 o'clock in the morning. The trip was looked forward to with a considerable amount of interest, and the inclemency of the weather was responsible for the small number of starters.

After the small caravan of horseless carriages had traveled but a short distance, a number of aggravating mishaps occurred, one being the breaking of a chain which resulted seriously so far as loss of time was concerned. This accident necessitated the return to the city of one of the party whose machine was still intact, for the purpose of securing a link to replace the broken one. After repairs were made the autoists renewed their journey and reached Racine without further difficulties of a serious nature. The return trip, however, was prolific of several breakdowns which were quite exasperating, and detracted materially from the pleasure of the run. The roads between Milwaukee and Racine, which are usually in good condition, at places were absolutely unfit for automobiling, while other portions were only fairly good.

All automobilists may profit by the experiences of last Sunday's excursion, inasmuch as it conclusively demonstrated that before undertaking a trip through the rural districts, it is well to inspect machines and be prepared for emergencies.

Mr. and Mrs. C. E. Golder, Mr. and Mrs. E. H. Warnke, and Mr. and Mrs. Fred Herwig, composed the party who made the trip.

PATRIOTS' DAY IN BOSTON.

Motorcycle Hill Climb and Massachusetts Club Run Only Activities.

Special Correspondence.

BOSTON, April 24.—Owing to the failure of the Massachusetts Automobile Club to hold its hill-climbing contest as has been its custom in past years, Patriots' Day was rather quiet in automobile circles about Boston. There was a contest on the Commonwealth avenue hill, but it was for motorcycles and was under the direction of the Harvard University Motor Cycle Club. There was a fair number of entries and some very good times were made. H. Ernest Rogers, an automobilist, was among the competitors with an Indian motor-cycle, and he won one race and secured a place in another. The event which was taken by Rogers was the open, and he defeated Oscar Hedstrom, who also rode an Indian and E. B. Belcher with a Hercules. Rogers's time was 18 2-5 seconds. The contest for stock machines, 110 pounds and under, went to Charles Gustafon, of Springfield, with an Indian, in 22 2-5 seconds. C. E. Erickson with a Metz, was second and Rogers third. The event open to students of Harvard was won by L. E. French with a Metz, in 25 4-5 seconds. Several thousand persons witnessed the contests.

A large number of members of the Massachusetts Club took part in the first run of the season to Providence on the holiday. About seventy-five machines made the trip to the Rhode Island city and return, and their occupants while in Providence were entertained by the members of the Rhode Island club. A reception was held at the club-house and later a dinner was served. On the trip a number of machines met with hard luck, punctured tires being frequent, testifying to the unfavorable condition of the highways.

QUAKER CITY CLUB ACTIVE.

Arranging Hill Climbing Contest, and Working for State Organization.

Special Correspondence.

PHILADELPHIA, April 24.—These are busy times for the local automobile club. Members are pouring into the A. C. of Philadelphia at such a rate that the board of governors has urged immediate action on the part of the committee appointed to secure new quarters, and which has been looking into the merits of several propositions submitted to it for consideration. It is unofficially announced that the offer of the Manufacturers' Club to give the A. C. of P. the use of a whole floor of its building at a fair figure will be accepted. While such a scheme will not provide garage accommoda-

tions, it will give the members ideal quarters, with all the conveniences in the way of location and service that go with membership in the Manufacturers' Club, which by the way, is one of the foremost social organizations in the city. Indeed, not a few of the members of the A. C. of P. are also on the rolls of the former club, and it was largely through their efforts that such a favorable proposition was made to the automobilists.

At last Wednesday's meeting of the board of governors fourteen new members were placed on the roll, making the total now close to 230. A resolution was unanimously adopted similar to that of the Automobile Club of America, urging its members not to pay the fines of their chauffeurs who may be arrested and convicted of fracturing the speed laws.

Action was also taken at this meeting of the board upon a proposition looking to the formation of a state automobile organization. A committee was appointed to take the necessary steps in the matter, besides, laying plans for the organization of clubs in all the larger cities and towns of the state which do not already possess such an organization. In the recent fight for favorable laws before the state legislature the need of a state organization was manifest, the demonstration upon the occasion of the hearing before the senate judiciary committee looking very much like a Philadelphia affair, whereas the rights of every automobilist in the state were involved. Besides Philadelphia and Pittsburg, the only towns in the state which can claim regularly organized automobile clubs are Allegheny, Harrisburg, York, Scranton and Wilkes-Barre.

The runs and tours committee of the A. C. of P. is hard at work on the details of the coming hill climbing contest. It has already been decided that the course to be selected must be sufficiently difficult as to obviate the possibility of any of the contestants exceeding the legal speed limit. Standing starts will be required, and all contesting cars must carry their full complement of passengers and come to the tape in regular touring trim.

On Saturday almost every member of the club who could get away rode down to Atlantic City, returning last night or this morning. It was the largest gathering of local automobilists in the history of the club, and the glorious weather made the trip one long to be remembered. So numerous were the motor cars at the shore that several A. C. of P. officials are already talking of the advisability of organizing for next Easter some such function as a gymkhana, floral parade, or possibly a race meet if a suitable course can be secured.

FIVE-DAY TOUR IN JUNE.

Albany Club Plans Interesting Event—Not Confined to Members.

Special Correspondence.

ALBANY, April 24.—The Albany Automobile Club has arranged for its first run of the season a five days' tour, commencing on Friday, June 16. The itinerary will be as follows: Albany to Poughkeepsie, on the 16th; to New York City on the 17th; New Haven on Sunday, the 18th; Springfield on the 19th, and Springfield to Albany on Tuesday, the 20th. The total distance is 415 miles.

This run will not be confined to members of the Albany club, but all automobilists in the vicinity are requested to participate. It will be a go-as-you-please affair, except that all who take part are expected to report at the cities mentioned on the dates given, where hotel and garage acommodations will be provided. All drivers will be furnished with a list of the towns en route, and distances between, and the leading car will mark with confetti all doubtful turns along the way.

Arrangements for the tour are in the hands of the club's runs and tours committee, which is composed of Matthew Van Alstyne, chairman; Howard Martin and Edward Leahy. This committee urges those who contemplate participating in the tour to so advise the chairman, at 372 Broadway, Albany, not later than May 1, in order that the best possible hotel and garage accommodations may be secured.

WINNIPEG CLUB ELECTION.

Officers and Committees Named—Touring and Roads Given Attention.

Special Correspondence.

WINNIPEG, MAN., April 19.—The annual general meeting of the Winnipeg Automobile Club was held this week and the election of officers for the ensuing season took place.

Sir Daniel McMillan Lieutenant-Governor of Manitoba has again consented to be patron of the club and the Hon. Robert Rogers was elected honorary president. Dr. Webster who filled the position of President during last season, retired from office and Dan Bain, whose name is familiar to sportsmen both in Canada and America, was elected president for the year. Professor Kenrick, who acted as secretary-treasurer during the first year of the Winnipeg club's existence, succumbed to an attack of typhoid fever in the latter end of the year, and the office of secretary-treasurer, rendered vacant by his death, was filled by the election of A. Emmett.

A touring and racing committee was also elected which will have charge of club runs and tours, and also map out a scheme for the distribution of sign posts at various points throughout the country which will prove beneficial to tourists from over the border.

Legislative measures on the part of the city authorities will also receive attention from a special committee, which will endeavor by every means in its power to prevent the enactment of measures detrimental to the interests of automobilists generally.

Road improvement will be asked for within a radius of twenty miles of the city, and should the club be successful in getting the authorities to work in this direction, it will have a great influence on the sale of cars as a number of prospective buyers are only held back by the indifferent road surfaces beyond the city limits.

The Australian Cricketers, who are on their way to England, arrived in Winnipeg Sunday morning, at 10 o'clock, and were met by the members of the automobile club who placed their machines at the disposal of the visitors for a tour of the city, during the few hours they had to stay over before leaving for New York.

CLUB RUN TO CITY ISLAND.

The second run of the season of the New York Motor Club will be held on Sunday, April 30, with City Island as its destination. The cars will assemble at Broadway and Fifty-ninth street, Manhattan, and are scheduled to leave that point promptly at 11 a. m., going through Central Park to 110th street; thence through Seventh and Jerome avenues to Yonkers, where a short stop will be made at Getty Square; thence east through Mount Vernon to the New Rochelle road, south to the junction of the Shore and City Island roads, and east to City Island. The leading car will distribute confetti at the several turns, in order that those unfamiliar with the route may not lose the way.

A shore dinner will be served at the Bay View Hotel, City Island, after which the members and their guests will be given a boat ride about the Island, or elsewhere, a number of power boats having been provided for the purpose.

The club has accepted the invitation of the Automobile Club of America to take part in its annual parade on Saturday, April 29, and the runs and tours committee has urged its members to participate. The division to which the club has been assigned will be under the command of Marshal A. R. Pardington, and will form on West Thirteenth street, entering from Broadway and facing Fifth avenue. A large attendance is assured, and all have been requested to be in position not later than 2 o'clock p. m.

NEW CLUB FOR CAPITAL CITY.

Special Correspondence.

WASHINGTON, D. C., April 24.—Steps have just been taken by a number of prominent automobile owners to form an automobile club, and the indications are that before the year is much older Washington will have a strong club. In the early days of automobiling here the National Capital Automobile Club was formed by General Nelson A. Miles and two score other automobilists of national reputation. The membership was gradually increased and eventually reached 200. About this time two factions arose in the club and soon it was on the downward path. To-day it exists in name only. The promoters of the new club scheme are proceeding along different lines and it is expected they will be able to enlist the support of many who have heretofore frowned upon the club idea. The matter of a club house will receive early consideration.

FARSON GETS LOVING CUP.

Special Correspondence.

CHICAGO, April 24.—At the last regular meeting of the Chicago Automobile Club, a loving cup was presented to Ex-President John Farson, by the members of the board of governers, in acknowledgment of his services as the chief executive of that organization from November 12, 1903, to March 1, 1905. The presentation speech was made by Ira M. Cole, president of the club. During Mr. Farson's administration the club membership list was increased from 100 to 500 members.

GERMANTOWN CLUB GROWING.

Special Correspondence.

PHILADELPHIA, April 24.—Work has been commenced on the addition to the garage of the Automobile Club of Germantown, and will be rushed to completion. The summer café is also being enlarged, and so constructed that it can be readily enclosed on the approach of cold weather.

The club's waiting list is steadily growing, and the question of increasing the present membership limit of 100 is considered at every meeting.

On Friday night, April 28, a rather novel entertainment will be given at the clubhouse in the shape of a vaudeville dinner. The vaudeville "stunts" will be carried on during the dinner, and, as Secretary Robert P. Hooper promises, " will certainly lend quite a variety to the menu."

There is a very general wail on the part of many members owing to the delay in delivery of new cars, about twenty-five persons having ordered 1905 cars and have not

yet received them. Meanwhile interest in club runs is dormant. Every one of the new cars is of more than 30 horsepower.

NOTES OF THE CLUBS.

TRENTON, N. J.—The Mercer County A. C. has been formed here, and the following officers elected: John A. Campbell, president; Karl G. Roebling, vice-president; J. W. Foster, treasurer; Wilbur F. Sadler, Jr., secretary. The club's executive committee consists of John L. Kuser, Thomas T. Thropp, John S. Broughton and Charles Van Syckel. There are now about 250 automobilists in the city, and the prospects for the success of the club are very bright.

PITTSBURG.—The A. C. of Pittsburg will have an Orphans' Day on June 7, as suggested by the New York Motor Club. Secretary J. Linford Smith has taken the matter up with the club governors, and is now in correspondence with the superintendents of the several charitable institutions of the city, enlisting their aid in making the necessary arrangements. Club members will lend their cars and hundreds of orphans will be taken to some good picnic ground near the city for a day's outing. The club has also decided to hold a hill climb May 20 and a race meet at Brunots Island June 28-29.

SYRACUSE.—The A. C. of Syracuse has recently elected ten new members, and ten applications for membership have since been received. It was announced in February that an effort would be made to swell the roll to 125 members before the close of the year, and, inasmuch as twenty have been admitted since that time, it now looks as if the efforts in this direction will be fully recorded before spring is over. A schedule of summer runs and short tours will be arranged at a meeting to be held in a few days. The roads in all directions are now quite good, and the fair weather the past few days has brought out the automobilists in large numbers.

DENVER.—At a banquet held at the new Savoy Hotel a few evenings ago the local automobile dealers formed an organization which will work in harmony with the Colorado Automobile Club, and will have for its object the securing of more favorable quotations from manufacturers, the prevention of legislation which would tend to injure the industry, to guard against the slashing of prices, and to promote automobile shows and race meets. The following temporary officers were elected: W. B. Felker, president; Charles Bilz, secretary; C. G. Shearer, treasurer, and W. B. Felker, G. E. Hannan, E. R. Cumbe, A. Winston, E. A. Colburn, Thomas Botterill and Charles Bilz were named as board of directors.

PROVIDENCE.—The first run of the season of the Rhode Island A. C. will be held on Saturday, April 29, to Narragansett Pier and return. The run will be a go-as-you-please affair. The start of the small cars will be made at 11 o'clock, and those of higher power will begin the trip half an hour later. Dinner will be served at Green's Inn, and the return trip will be commenced in time to reach this city about 5 o'clock. A number of other short runs are being arranged for the season. A movement which is meeting with much favor among local club members is that of the Good Roads Association, which was recently formed here. The association numbers among its members many residents of the smaller towns, and its president is Roswell B. Burchard, of Little Crompton, who was the prime factor in its formation.

The German Emperor has presented the German A. C. with a cup for the motor boat races at Kiel at the end of June.

MORGAN & WRIGHT GOING TO DETROIT.

Big Auto Tire and Rubber Specialties Plant to Remove from Chicago and Be Reorganized — Architects Instructed to Prepare Plans for Huge New Factories in Detroit.

Special Correspondence.

DETROIT, April 24.—Authentic information comes from the East through Frank H. Eddy, of H. D. Edwards & Co., of this city, that it has been definitely decided to move the Morgan & Wright plant from Chicago to Detroit. Mr. Eddy, who went East to attend the annual meeting of the Rubber Goods Manufacturing Company, says, also, that Morgan & Wright will build a new plant for manufacturing rubber goods that will cover between six and seven acres.

This is regarded as a great addition to Detroit, as Morgan & Wright now do a business exceeding $2,000,000 a year. The plant now employs 600 skilled workmen in the making of automobile tires and rubber specialties.

The company, it is stated, will be reorganized under the laws of Michigan and Frank W. Eddy and Frank H. Croul, of Detroit, will be the managing directors, making it essentially a Detroit concern, although still a component part of the Rubber Goods Manufacturing Company.

Rogers & McFarland, local architects, have had a conference with the Rubber Goods Manufacturing Company, and have been instructed to prepare a set of plans for the proposed new factory. It is probable that the old Peninsular Iron Furnace property will be the site on which the new factory will be located. It is stated that President Charles H. Dale, of the Rubber Goods Manufacturing Company, says that the new factory must be in operation by January 1, 1906. He will come to Detroit shortly with several of the directors of the company to look over the ground.

CHICAGO, April 24.—Morgan & Wright, manufacturers of rubber goods and automobile tires, have decided to leave Chicago. Before the end of the year the plant will be moved to Detroit. The principal reason for making the change is said to be the desire of the manufacturers to be in close relation to the colony of automobile factories located in Detroit.

AUTO 'BUS LINE IN NEW MEXICO.

Special Correspondence.

KANSAS CITY, April 22.—E. P. Moriarty & Co., of this city, yesterday sold to J. W. Stockard, of Roswell, N. M., four Winton cars, equipped with Cape tops, which will be put in use on the mail and passenger route between Roswell and Torrance, connecting the Rock Island and Santa Fe railroads in the southeastern part of New Mexico.

This route is 105 miles long, and it is intended to schedule the cars so as to make the trip in six hours. There are only four houses between the two towns. Mr. Stockard believes he sees good things ahead for his route, as, he says, "the distances are too great and the schedule too short for horses."

TRADE CONDITIONS IN WINNIPEG.

Special Correspondence.

WINNIPEG, MAN., April 19.—At the commencement of 1904 the automobiles in the city consisted principally of runabouts and touring cars of moderate horsepower. This season, however, a decided change is noted in the class of car sought by purchasers, the tendency being in favor of cars of about thirty to thirty-five horsepower. Among the cars brought in are the Darracq, Winton, Pope-Toledo, Ford, Cadillac, and the Marion.

To meet the continually growing requirements of automobilists, McCulloch and Boswell, who were the pioneers of this business in the West, have taken over the Granite Rink, a commodious and convenient building more than 250 ft. long by 100 feet wide, where they have established a garage and repair station capable of handling and storing more than 100 cars. This firm is also experimenting with a two-cycle air-cooled car manufactured throughout in Winnipeg, which, should it prove as successful as they anticipate, will find a ready sale, as water-cooled machines are practically barred from use here during the winter months, owing to the extreme cold.

KANSAS CITY DEALERS COMBINE.

Special Correspondence.

KANSAS CITY, April 22.—A consolidation of two of the leading automobile companies of this city has just taken place, the Missouri Valley Motor Company, Winfield Denton and P. B. Doddridge, proprietors, and Richter Brothers, being parties to the merger. The consolidated companies will occupy the new garage of the Missouri Valley company, which is now nearing completion at the corner of Fifteenth street and Troost avenue. The walls of the garage are now practically completed, and, as the building is of simple construction, it is expected to be ready for occupancy by May 15. The new quarters will be equipped as an up-to-date garage in every particular, and will have storage capacity for the increased number of cars it is expected to be called upon to accommodate by reason of the merger. The repair shop alone will occupy a space 50 by 50 feet.

The Franklin, Apperson Brothers and Locomobile cars will be handled, as well as a low-priced runabout not yet decided upon.

MARYLAND 'BUS LINE PLANNED.

Special Correspondence.

BALTIMORE, April 24.—The Automobile Company of Hartford County has been incorporated, having for its object the establishment of an automobile 'bus line between Carney and Bel Air, Md., with probable connecting lines to other nearby towns. Bel Air, the proposed terminus, is about thirty-five miles distant from Baltimore, and the plans contemplate the transfer of passengers for Baltimore to the Baltimore and Bel Air Electric line, which is now nearing completion.

The vehicles used will be of fourteen passenger capacity, and it is expected to have the line in operation about May 15.

RECENT INCORPORATIONS.

Automobile Company of Harford County, Belair, Md.; capital, $25,000. Directors, Stevenson A. Williams, John D. Worthington, Joseph W. Chamberlain, William E. Robinson, W. Beatty Harlan, J. Alexis Shriver, Willard G. Rouse, Philip H. Close and Dr. James F. H. Gorsuch.

Parkersburg Automobile Company, Parkersburg, W. Va.; capital, $15,000. Incorporators, S. D. Camden, S. T. Malden, G. L. Watson, J. W. Stewart, C. L. Muhlman, O. S. Hawkins, E. W. Mallory and H. C. Smart, all of Parkersburg.

M. & S. Tire Company, Boston, Mass.; capital, $200,000.

Hewitt Motor Company, New York; capital, $100,000. Directors, E. R. Hewitt, Erskine Hewitt and C. O. Snyder, all of New York.

A new edition of the "Hand Book of Gasoline Automobiles," has just been issued by the Association of Licensed Automobile Manufacturers, of 7 East Forty-second St., New York, and is an amplification of the Hand Book published some months ago. Like the original, this book contains engravings and specifications of the gasoline automobiles manufactured by members of the Association; but the space devoted to each maker is increased in the new edition, many models being described that were crowded out of the first edition. The book is a great convenience to anyone desiring information on these cars.

The Torbensen Motor Car Company and the Rajah Auto Supply Company have been incorporated, and the two have succeeded the former Torbensen Gear, Inc., of Bloomfield, N. J. The first-named company has acquired the patents on the Torbensen gear, together with all material connected with the automobile department of the former corporation, and will continue the business at Bloomfield, while the Rajah Auto Supply Company has in like manner acquired the accessory department of the old company, and will conduct this branch of the business at 140 Washington street, New York.

The Boston Insurance Company, of Boston, issues a form of policy covering general automobile risks within the limits of the United States and Canada, including while in course of building, on the road, on railroad cars or other conveyances, ferries, inland or coastwise steamers. Further than the limits named, there are no limitations or restrictions placed upon the use of the machine, or as to the use or storage of gasoline. At an increased rate the policy is made to cover foreign countries as well. Baldwin & Fuller, 63 William St., are New York agents for the company.

The Springfield Automobile Company, of Springfield, Mass., has acquired a site on Liberty St. opposite the Union station, 100 by 117 feet, and will at once commence the erection of a modern garage. The building will be rushed to completion, as its present quarters on North Main St. are much too small for the requirements of the business. Willis F. Anderson and F. G. Jager are proprietors of the company, which has the local agency for the Locomobile, Stevens-Duryea, Columbia and Franklin cars.

The West Indies Transportation Company is now operating a line of automobile 'buses between Marinao and Guanajay, Cuba, a distance of about thirty miles. Three vehicles are now in service, and others will be added later on. For a greater part of the distance the roads traversed are along the route of the recent Cuban road race. There is an excellent opening in Cuba for the establishment of many such lines of service.

Howard Longstreth, a prominent member of the Automobile Club of Philadelphia, has sailed for Europe on the steamer *Cedric*, and expects to spend the greater part of the year touring in England and on the Continent. Mr. Longstreth will use his Packard touring car, which he shipped ahead by another vessel.

W. Knipper, a tester for the Pope Motor Car Company, of Toledo, and who will accompany Herbert H. Lyttle as mechanician in the Gordon Bennett Cup race, was the first person to be arrested under the new ordinance prohibiting the racing of automobiles over the streets of that city. Knipper was arrested last week while trying out the new Gordon Bennett racing car, and was fined $25 and costs.

It is announced that Carricaburu, the Cuban driver who piloted E. J. Conill's Mercedes to victory in the Cuban road race in February, will compete in the track meets of the metropolitan district during the coming season. Mr. Conill has purchased a new racing car for this purpose, his Havana cup winner being used now solely for touring purposes.

James A. Door, of Oakdale, Mass., and G. B. Louderbach, of St. Louis, are interested in the newly organized Friction Drive Automobile Company, of Worcester, Mass. It is reported that the company will occupy the factory building at the corner of Main and Mill streets, and will commence at once the installation of machinery for the manufacture of automobiles.

Albert C. Bostwick, a well-known enthusiast in the early days of American automobile racing, and now a resident of Nice, France, has recently ordered a Packard touring car. With the addition of this machine Mr. Bostwick's stable will consist of two Packards, one Panhard and two Mercedes cars.

The City of Minneapolis has decided to give the automobile a trial in its fire department service, and will provide one for the use of the chief of this department. If this machine proves satisfactory, the police department will also be provided with such a vehicle.

The Pardee-Ullman Company, of Chicago, has moved into its new quarters at 1218-1220 Michigan Ave. The new building, which was built especially for the company, is of brick, two stories in height, and much better adapted to the needs of the business than were the former quarters.

The Chicago branch of the Knox Automobile Company has occupied its new salesrooms at 1208 Michigan Ave., which are much more commodious than the quarters recently vacated, being 50 by 170 feet. George A. Crane is manager of this establishment.

L. D. Bolton, formerly Chicago representative of the Federal Manufacturing Company, of Cleveland, is now connected with the Diamond Chain and Manufacturing Company, of Indianapolis, and will represent this company in the Middle and Western States.

The railroad men of Chicago are arranging to entertain the delegates to the International Railway Congress, which will meet in that city on May 3, with an automobile tour of the city. F. C. Donald, former president of the Chicago Automobile Club, will have charge of the tour.

United States Senator Elkins, of West Virginia, and Price Ewiwha, of the Korean Legation, are among the recent purchasers of Pope-Toledo touring cars through the Washington City branch of the Pope Manufacturing Company.

The New York branch of the Hartford Rubber Works Company, now located at 97 Chambers St., will on May 1 remove to 88 Chambers, a few doors east and across the street from its present quarters.

The Motz Clincher Tire and Rubber Company has been incorporated at Akron, O., with a capital of $50,000, to manufacture and market clincher solid and semi-solid tires. Charles A. Motz and others are named as incorporators.

Michigan's first attempt at a cross-country 'bus line is now being made at Stockbridge. L. G. Gordon and others are interested in the organization of a company which contemplates operating a line between Chelsea and Mason, a distance of about forty miles.

As a result of an explosion in the garage of the United States Express Company, at Washington City, on the night of April 20, engineer J. J. Ball was killed and his assistant seriously injured. The cause of the explosion has not yet been determined.

The Royal Equipment Company, of Bridgeport, Conn., makers of the Raymond Brake, has removed from 55 Golden Hill St. to 165 Housatonic, where it has larger quarters, and has installed improved machinery, adding greatly to its facilities.

The Motor Car Equipment Company, of 43 Cortlandt St., New York, has issued a large and very complete catalogue showing its line of domestic and imported automobile specialties. This company is successor to Emil Grossman.

W. F. Smith, manager of the Philadelphia branch of Thomas B. Jeffery and Co., has been instrumental in forming another Rambler Automobile Club, this time at Millville, N. J. All of the members of the new club own and operate Rambler cars.

The Tincher Motor Car Company, with offices in the Monadnock Building, Chicago, has occupied its new factory on Jackson Boulevard and Robey St., a two story and basement brick building.

The Depot Carriage and Baggage Company, of Kansas City, has purchased six Rambler cars for its livery service in that city. The company, by the way, has secured the Rambler local agency.

H. L. Radford, formerly of Boston, an engineer of several years' experience with hydro-carbon engines, is now connected with the Grout Brothers Automobile Company, of Orange, Mass.

The McGiehan Odometer and Manufacturing Company, of New York, has opened a sales agency at 970 Drexel Building, Philadelphia, in charge of T. H. McGiehan.

The American Motor Company of New York has filed certificate of incorporation, increasing its capital stock from $3,000,000 to $6,000,000.

Charles F. Brown, of Greenville, Pa., has been appointed manager of the Chicago branch of the Winton Motor Carriage Co., of Cleveland.

The Gotham Automobile Co., 1556 Broadway, has removed to 1665 Broadway. This company has secured the agency for the Stevens-Duryea cars.

Charles E. Miller, automobile supply dealer at 97 Reade St., New York, has opened a branch store at 406 Erie St., Cleveland.

The American Motor Bearing Company, of Cornwall, Ont., will at an early date establish an American branch at Buffalo, N. Y.

The Chicago Public Library is now using Knox delivery wagons in its daily service.